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The New Brunswick Developer's Guide to Renewable Energy

June 9, 2009

Department of Energy

EXECUTIVE SUMMARY

Jacques Whitford was engaged by the New Brunswick Department of Energy (DOE) to prepare this guidance document entitled "New Brunswick Renewable Energy Development Guidance Document". The purpose of the guidance document is to identify and summarize in one location, the requirements and processes required in New Brunswick for the development of renewable energy projects in the electricity sector. This document is geared towards renewable energy developers and describes the current electricity market, government policies and legislation as well as funding assistance opportunities that may be relevant to renewable energy projects in New Brunswick.

There are many important reasons to increase use of renewable energy that are pushing the growth of these technologies. Generating energy from local, renewable resources, including the wind, sun, ocean, biomass and the earth, improves reliability, diversity and security of supply, is increasingly affordable, improves system reliability and price stability, and provides a sustainable supply of energy. Climate change and greenhouse gas (GHG) emission management have also emerged as related energy concerns to government officials and the public. With the development and evolution of regulations on GHG emissions in an attempt to reduce atmospheric CO_2 concentrations and combat climate change, support for renewable energy will be critical if the province is going to participate successfully in GHG reduction initiatives. The economic development objectives of the New Brunswick Energy Hub also include expansion of renewable energy resources, to provide more jobs in the energy field, as well as a cleaner energy product for both in-province use and export. This guidance document provides an overview of key legislation, regulations and policies that currently govern renewable energy development in New Brunswick, and will guide developers to the appropriate government departments and agencies to aid in meeting these requirements in the most streamlined and efficient manner. Early consultation with government and other key stakeholders is highly recommended to facilitate the development process.

This guidance material is designed for the following renewable energy resources:

- wind;
- hydro;
- biomass;
- tidal;
- geothermal; and
- solar.

Information regarding the following topics is provided:

- background on the New Brunswick electricity system structure; and
- regulatory information and associated project planning requirements to assist in informed decision making with regards to development proposals in the province.

An introduction to the document as well as basic summaries of the New Brunswick electricity market structure, scales of generation and the application processes required to sell electricity are provided in Chapter 1. An overview of relevant regulation and policy is provided in Chapter 2 along with potential timeline ranges for key processes. Chapter 3 focuses on specific requirements that may affect

development of certain renewable energy sources, such as environmental assessment specifics and Crown land leases for various types of development. For each type of renewable energy project, there is a simplified flowchart with the step by step regulatory and development processes. Funding opportunities, the generation and management of GHG credits, and other aids to developers are also presented and discussed.

This guidance document is focused on the approvals that proponents need from provincial and federal departments. Information regarding business or financial aspects of project development as well as technical topics such as site selection, design, construction, operation and maintenance concerns is beyond the scope of this document. Information included was thought to be current as of the date of production and will be reviewed annually.

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Glossary and acronyms

ACOA	-	Atlantic Canada Opportunities Agency
Carbon Offset Credit	-	One tonne of carbon dioxide equivalent (CO_2eq) created by a reduction or removal of a GHG emission that takes place because of a specific project undertaken with this expressed purpose.
Capacity Factor		Actual amount of power produced divided by power that could have been produced at maximum output.
CCA	-	Capital Cost Allowance
CCME	-	Canadian Council of Ministers of the Environment
CDM	-	Kyoto Protocol's Clean Development Mechanism allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, an internationally recognized Carbon Offset Credit, each equivalent to one tonne of CO_2eq.
CEA Agency	-	Canadian Environmental Assessment Agency
CEAA	-	*Canadian Environmental Assessment Act*
CEPA	-	*Canadian Environmental Protection Act, 1999*
CRCE	-	Canadian Renewable and Conservation Expenses
Crown land	-	Land that is owned by the government
cumulative environment-al effect	-	the effects on the environment, over a certain period of time and distance, resulting from the effects of a project when combined with those of other past, present and imminent future projects and activities
CWS	-	Canada Wide Standards
DFO	-	Fisheries and Oceans Canada
DOE		Department of Energy
EA	-	Environmental Assessment, as defined by *CEAA*, "means, in respect to a project, an assessment of the environmental effects of the project that is conducted in accordance with this Act and the regulations"
EC	-	Environment Canada

EIA	-	Environmental Impact Assessment, as defined in the New Brunswick *Environmental Impact Assessment Regulation*
environmental effect	-	as defined by *CEAA* means: "...in respect to a project, any change that the project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological paleontological or architectural significance, and any change to the project that may be caused by the environment, whether any such change occurs within or outside Canada"
EPP	-	Environmental Protection Plan
ERP	-	Environmental Response Plan
ERS	-	Emergency Response System
FA	-	Federal Authority as defined by *CEAA* means: "(a) a Minister of the Crown in right of Canada, an agency of the Government or other body established by or pursuant to an Act of Parliament that is ultimately accountable through a Minister of the Crown in right of Canada to Parliament for the conduct of its affairs, any department or departmental corporation set out in Schedule I or Ii to the Financial Administration Act, and any other body that is prescribed pursuant to regulations made under paragraph 59(e)
GHG	-	Greenhouse Gases, radiative gases in the earth's atmosphere which absorb long-wave heat radiation from the earth's surface and re-radiate it, there-by warming the earth
HADD	-	Harmful Alteration, Disruption or Destruction (of fish habitat, as defined by the federal *Fisheries Act*)
HES	-	Health, Environment and Safety
KWh	-	Kilowatt hour equals one thousand watts supplied for a period of one hour. A measure of electrical power consumption
MAC		Market Advisory Committee, a multi-stakeholder committee that provided advice to government regarding restructuring of the electricity market
MWh	-	Megawatt hour equals one million watts supplied for a period of one hour. A measure of electric power consumption
MPMO		Natural Resources Canada's Major Projects Management Office
NAPS	-	National Air Pollution Surveillance Network
NAV Canada		Canada's civil air navigation services provider, is a private sector, non-share capital corporation financed through publicly-traded debt. With operations coast to coast, NAV CANADA provides air traffic control, flight information,

		weather briefings, aeronautical information services, airport advisory services and electronic aids to navigation.
NBCAA	-	*New Brunswick Clean Air Act*
NBENV	-	New Brunswick Department of Environment
NBDNR	-	New Brunswick Department of Natural Resources
NBDOE	-	New Brunswick Department of Energy
NBPD&CS	-	NB Power Distribution and Customer Service Corporation
NBPG		NB Power Generation Corporation
NBPT		NB Power Transmission Corporation
NBSO	-	New Brunswick System Operator, a not-for-profit statutory corporation that came into existence on October 1, 2004 with the proclamation of the *Electricity Act*
NEB	-	National Energy Board
Net metering	-	A program that allows customers to produce their own renewable energy by connecting a small generation unit (under 100 kW) to NB Power's distribution system. The energy must be compatible with Eco Logo™ certified standards.
NPRI	-	National Pollutant Release Inventory
NRC	-	Natural Resources Canada
Open access transmission tariff		*Electricity Act* - A tariff pertaining to the provision of electricity transmission services requiring that those services shall be provided through an open and non-discriminatory process to furnish access to transmission services.
PM	-	Particulate Matter
PTRC	-	Provincial Technical Review Committee, a multi-departmental committee charged with reviewing EIA draft reports and eliciting clarifications from the project proponent.
RA	-	Responsible Authority. Defined in CEAA as "...in relation to a project, means a federal authority that is required persuant to subsection 11(1) to ensure that an environmental assessment of the project is conducted"
REC	-	Renewable Energy Credit
renewable energy	-	Energy derived from resources that are regenerative or for all practical purposes cannot be depleted

RETP	-	Renewable Energy Technologies Program
RPS	-	Renewable Portfolio Standard
residual environmental effect	-	an adverse environmental effect that remains after the mitigation has been implemented
significant residual environmental effect	-	An adverse residual environmental effect that exceeds the environmental effects significance rating criteria
SIS	-	System Impact Study
TC	-	Transport Canada
TRC	-	Technical Review Committee
Triggers	-	Triggers are powers, duties or functions (e.g. issuing permits, granting approvals, or providing funding) performed by a federal authority that require it to conduct an environmental assessment under the *CEAA*.
TDGA	-	*Transportation of Dangerous Goods Act*
TEAM	-	Technology Early Action Measures
US EPA	-	United States Environmental Protection Agency
USD	-	United States Dollar
VEC	-	Valued Environmental Component
WAWA	-	Watercourse and Wetland Alteration Permit

1.0 INTRODUCTION

Jacques Whitford was engaged by the New Brunswick Department of Energy (DOE) to prepare this guidance document entitled "New Brunswick Renewable Energy Guidance Document" for use by renewable energy developers to inform them of government policies, funding assistance opportunities, demand, and regulations affecting new and expanded developments or projects. This report references many relevant acts, regulations, policies and guidance documents which could apply to the development of renewable energy projects in New Brunswick. Where available, links are provided to related websites which should be checked to ensure the most up-to-date information.

The guidance document provides renewable energy developers with background on the current New Brunswick electricity system structure and a collection of recent information surrounding legislation and associated project planning issues which will allow for informed decision making regarding their proposed project. This guidance document is focused on the approvals that proponents need from provincial and federal departments. Information regarding business or financial aspects of project development as well as technical topics such as site selection, design, construction, operation and maintenance concerns is beyond the scope of this document.

This introduction describes the purpose and content of the guidance document and provides an overview of the New Brunswick electricity system structure. Key regulations are summarized in Chapter 2 by area of focus as follows:

- environmental assessment;
- environmental reporting;
- water protection regulations;
- air protection regulations;
- land protection regulations;
- flora and fauna, fisheries protection regulations;
- Energy related regulations;
- employment related regulations;
- greenhouse gas programs/regulations; and
- local government regulations.

Information on public and private property is also provided in Chapter 2.

In Chapter 3, regulations, guidance and policies that are likely to apply more specifically to each type of renewable energy project type are identified and discussed for the following renewable energy sources:

- wind;
- hydro;
- biomass;

- geothermal;
- tidal; and
- solar.

An overview of a variety of funding incentives is provided in Chapter 4. Chapter 5 provides concluding remarks. References used in the preparation of the guidance document, as well as a list of relevant websites, contacts, and FAQs are provided in Chapter 6.

Representatives from several provincial government departments and agencies assisted in the preparation of this guidance including:

- Natural Resources;
- Public Safety;
- Local Government;
- Transportation;
- Environment (EIA);
- Environment (Planning);
- New Brunswick System Operator; and
- New Brunswick Power.

Renewable energy developers are encouraged to engage the appropriate organisations and departments early in the development process. This will ensure that proper guidance is gained early and planning can be done in consideration of this so as to reduce hurdles later. Further, early consultation may help refine the scope of the project, for example, by narrowing the list of potential locations, and identifying critical components like resource and power grid access.

1.1 How to use this Guidance

Developers may use this information to become familiar with regulations, organizations and information relevant to proceeding with renewable energy projects in New Brunswick. This guidance should serve as general reference only. It is not a legal interpretation of any policies or regulations. The guidance is not intended to provide every detail or regulatory requirement. Caution should be used in ensuring that revisions and adjustments to legislation, policies or programs that may have occurred since the publication of this guide are taken into account. Therefore, the appropriate organization should be contacted to obtain the most recent information. Contact information for all agencies discussed in this guidance is provided in Chapter 6. Information included in this guidance was thought to be current as of the date of production and will be reviewed annually.

1.2 Advantages to Building a Renewable Project in New Brunswick

One of New Brunswick's key development advantages in comparison to other jurisdictions is the public support that has been developed over the years for the siting of large industrial facilities, including new electricity generation. This environment of trust in the province's environmental assessment and safety processes is evidenced by strong public support for the refurbishment of the Point Lepreau Nuclear Generation Station, the construction of the Liquefied Natural Gas facility near Saint John, and the development of several substantive wind turbine farms around the province. With several major projects on-going, a skilled workforce is growing to support current and future projects.

While the province itself has a relatively modest demand for electricity (peak winter demand in the order of 3,500 MW), geographically, it is close to major loads in New England and the Maritimes, and has a relatively strong internal transmission system that is open for access. The potential for natural disasters, such as hurricanes and earthquakes is low. New Brunswick's indigenous energy sources include biomass, small amounts of natural gas, and a world class wind regime. New Brunswick's energy hub strategy, coupled with a small government that responds quickly to developer needs, also supports the ability to site new generation.

1.3 Provincial Electricity Structure, Market and Programs

On October 1, 2004, the New Brunswick *Electricity Act* was proclaimed and the electric utility industry in New Brunswick was restructured, including the provincially owned utility, NB Power Corporation. Competitive supplier choice for municipal utilities and large industrial customers served from the transmission system was provided for; the wholesale electricity market was opened; and a new corporation called New Brunswick System Operator (NBSO) was created (NBSO 2008). Market participants include:

- suppliers (NB Power Generation, NB Power Nuclear, Hydro-Québec, independent power producers);
- market delivery (NBSO, NB Power Transmission, Bayside Power); and
- major loads (NB Power Distribution, WPS Canada Generation Inc., PEI, NS, Maine, municipal distribution companies, NB large industry).

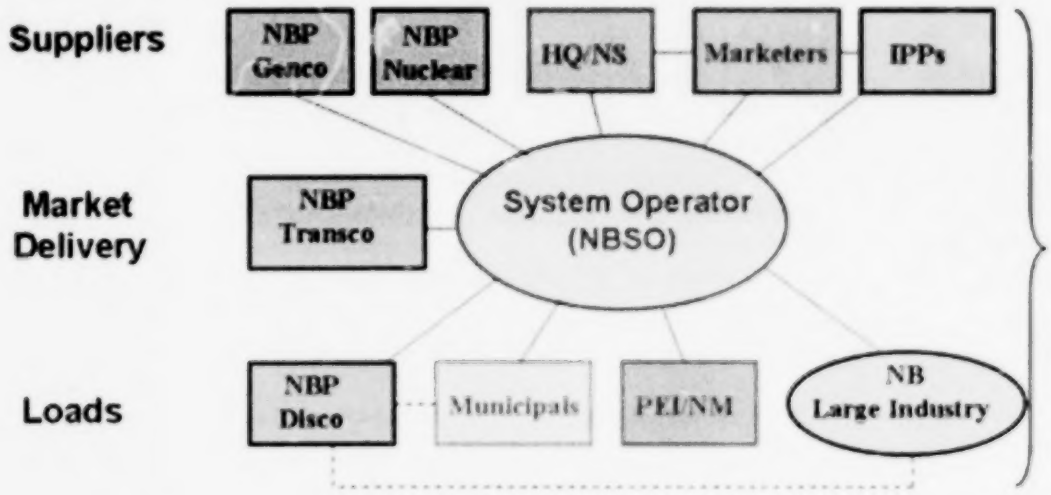
Market participant status must be applied for through the NBSO and is required in order to undertake any of the following activities, to:

- buy or sell in the market;
- supply ancillary services to the market;
- register a Facility with the NBSO; and
- use transmission service.

The New Brunswick Electricity Market is a physical bilateral market for injections and withdrawals at the boundaries of the electric power transmission system in New Brunswick. The market is built upon the foundation of a United States Federal Energy Regulatory Commission (FERC) Order 888 type open access transmission tariff. Deliveries of transactions between market participants are implemented by

NBSO in accordance with schedules submitted by the market participants. With Northern Maine, Nova Scotia and Prince Edward Island only connected electrically to the remainder of North America through New Brunswick, the New Brunswick market, in many ways, acts as a wholesale market for the region. A diagram of the basic market structure is provided in Figure 1.

Figure 1 NB Electricity Market Participants



Source: http://www.nbso.ca/Public/en/op/market/about.aspx

The New Brunswick Electricity Market Rules govern the rights and obligations of electricity market participants. The *Electricity Act* outlines the creation, organization and powers of the New Brunswick System Operator (NBSO), as well as the authority by which the Market Rules are made and changed.

The Market Advisory Committee (MAC), established via the *Electricity Act*, plays a key role in the electricity market by ensuring a coordinated, consistent and effective voice for market stakeholders. The MAC reviews market issues and provides recommendations to the NBSO Board of Directors.

A detailed description of the various components of the NB electricity market and the process to follow to become a wholesale market participant can be found on the NBSO website at:

www.nbso.ca/Public/en/op/market/default.aspx.

NBSO is a not-for-profit independent corporation whose primary responsibilities are to ensure the reliability of the electrical system and to facilitate the development and operation of a competitive electricity market in New Brunswick. It administers the Open Access Transmission Tariff (OATT). NBSO Operations is accountable for the reliable operation of the integrated power system, for the optimum utilization of energy and capacity resources and to plan, organize, schedule and communicate generation and transmission facilities outages.

The New Brunswick Energy and Utilities Board (NBEUB) is mandated with the regulation of electricity and other energy forms in the Province of New Brunswick, including retail and wholesale electricity transactions, as defined in the *Electricity Act*. The NBEUB also has regulatory authority over the

natural gas industry, public motor bus operators that transport passengers for hire in and out of the province, gasoline pricing, and pipeline construction. Each of these responsibilities is associated with different legislation.

The role of the NBEUB with respect to NBSO is to regulate the NBSO-administered Open Access Transmission Tariff (a tariff pertaining to the provision of transmission services to provide for open and nondiscriminatory access to transmission services) and to license Market Participants as defined by the *Electricity Act*. The *Electricity Act* states that "No person other than a distribution electric utility shall own or operate a distribution system within the Province." This limits the ownership and operation of distribution systems (<69 kV) to NB Power Distribution and the municipalities of Saint John, Edmundston and Perth-Andover, although amendements to the *Municipalities Act* to allow for internal distribution is awaiting proclamation. There is no limitation in the *Electricity Act* on owning or operating transmission systems.

1.3.1 New Brunswick Power Group

In 2004, NB Power Corporation officially became NB Power Holding Corporation with four subsidiaries. Information on New Brunswick's Crown corporation, NB Power Holding Corporation and its subsidiaries is summarized below as found at:

www.nbpower.com/en/companies/companies.aspx.

The NB Power Group of companies is a Crown corporation that generates and delivers electricity via transmission and distribution lines, substations and terminals to direct and indirect customers within New Brunswick, and to customers in New England, Quebec, Nova Scotia and Prince Edward Island.

NB Power Holding Corporation provides strategic direction, governance and support to the subsidiaries for communications, finance, human resources, legal and governance. The responsiblities and functions of each subsidiary are discussed briefly below.

NB Power Generation (NBPG) operates and maintains a diverse array of generating systems, consisting of hydro, coal, oil and diesel-powered generating stations. NBPG supplies the majority of in-province load through sales to NB Power Distribution and Customer Service (NBP D&CS). The remainder of in-province load is supplied through the three municipally owned distribution companies. NBPG also exports electricity to neighbouring New England, Quebec, Prince Edward Island and Nova Scotia markets.

NB Power Nuclear (NBPN) operates and maintains a CANDU 6 - 635 MW reactor at the Point Lepreau Generating Station. The Station provides approximately 25 per cent of New Brunswick's electrical energy requirements. It also sells to Maritime Electric Company, Limited.

NB Power Transmission (NBPT) operates and maintains terminals and switchyards that are interconnected by over 6,703 km of transmission lines ranging in voltage from 69 kV to 345 kV. The system is interconnected with electrical systems in North America, including Quebec, Maine, Nova Scotia and Prince Edward Island. With the proclamation of the *Electricity Act*, NBPT shares responsibility for system operation with NBSO. In addition to reliable transmission service, it provides for the security of transmission assets and ensures that the transmission system operates efficiently with minimum losses. Although there is no regulatory limitation on transmission in NB (private developers can install their own transmission lines), in most cases developers will arrange for

NBPT to install the required tranmission for a number of reasons, including but not limited to their local expertise and economics. Note that the developer requiring the connection is responsible for the costs of connection.

NB Power Distribution and Customer Service (NBP D&CS) is designated as the standard supplier in the *Electricity Act*, and is responsible for securing adequate capacity and energy to meet customer demand in New Brunswick.

The in-province load in New Brunswick was 14,250 GWh of electricity in 2007/08, with a peak in-province demand the same year of 2,992 MW. Approximately 40% of the load can be provided by a supplier other than NBP D&CS.

1.3.2 New Brunswick System Operator

Part III, section 42 of the *Electricity Act*, outlines the following legislated "Objects" of the NBSO:

- to exercise and perform the powers, duties and functions assigned to the NBSO under the *Act*, the market rules and its licence;
- to enter into agreements with transmitters giving the NBSO the authority to direct the operations of their transmission systems;
- to direct the operation and maintain the adequacy and reliability of the NBSO-controlled grid;
- to procure and provide ancillary services;
- to maintain the adequacy and reliability of the integrated electricity system;
- to enter into interconnection agreements with transmitters;
- to work with responsible authorities outside New Brunswick to coordinate the NBSO's activities with their activities;
- to participate with any standards authority in the development of standards and criteria relating to the reliability of transmission systems;
- to undertake and coordinate power system planning and development responsibilities to maintain and ensure the adequacy and reliability of the integrated electricity system for present and future needs and for the efficient operation of a competitive market; and
- to facilitate the operation of a competitive electricity market. (NBSO 2008b)

1.3.2.1 Transmission Grid Connection

The developer of an electrical generation project connecting to the transmission grid (>= 69 kV) requires New Brunswick System Operator (NBSO) approval. The NBSO is responsible for ensuring that the operation of the connected generator does not compromise the reliability of the grid or have any negative impact on existing transmission customers. For smaller generating facilities that are eligible to participate in net-metering and embedded generation projects (defined below) connected to the distribution system (< 69kV), the approval of the NBSO is not required. However, it may be advisable, as a courtesy, to advise the NBSO of such projects to take advantage of their advice and assistance.

Prior to connection to the transmission system the developer must enter into a generation connection agreement with NBPT and a transmission service agreement, and must apply to the NBEUB to become a Market Participant. Further information on facility connection can be found on the NBSO website at:

www.nbso.ca/Public/en/op/transmission/connecting/default.aspx.

Developers are encouraged to contact the NBSO early in the process to ensure that they establish a position in the NBSO Study Queue which defines the NBSO's work priorities. The process is outlined in NBSO Market Procedure 21 - Connection Assessment which can be accessed on-line at:

www.nbso.ca/Public/en/op/market/procedures/default.aspx.

The purpose of the Connection Assessment process is to allow the developer to determine in advance that their project will be permitted to connect to the grid. The cost of the assessments as well as the connection itself is the responsibility of the developer. The Connection Assessment process includes three major steps that follow the natural progression of a project.

Step 1: Feasibility Review. Upon application to the NBSO for a Connection Assessment, the NBSO will complete a Feasibility Review. The process is informal and is intended to highlight fundamental design limitations and to determine if a System Impact Study is required. If a System Impact Study is required the review will outline the scope of the study, a cost estimate, the scheduled completion date and the information requirements of the developer. The cost of the Feasibility Review is $5,000 (2008).

Step 2: System Impact Study. The System Impact Study (SIS) will document the impact of the proposed project on the transmission system and its customers; identify any measures required to mitigate the impact; and determine the need for additions or upgrades to the transmission grid which would lead to a Facilities Study. The SIS addresses both design and operational issues. Mitigating measures for issues identified in the SIS could include operating restrictions, additional facilities and special protection systems. The depth of the SIS can vary considerably depending on the size and location of the project and the potential system impacts.

Step 3: Facilities Study. The Facilities Study identifies the cost of any necessary upgrades that must be made to the transmission system in order to connect the project. The Facilities Study includes any design requirements necessary to mitigate the issues identified in the SIS. The study also outlines the costs that the developer will be responsible for and the scheduled completion date. The developer may not be responsible for the full cost of the modifications if those modifications provide additional system benefits to other customers.

The Connection Assessments can generally be completed in parallel with other planning and regulatory requirements. The Feasibility Review is generally completed within two weeks of the submission of a completed application. The System Impact Study and Facilities Study typically require a month upon receipt of the required information. The timelines are subject to the workload of the NBSO and external resources required to undertake the reviews/studies. In view of the fact that there are generally project uncertainties associated with each application, the NBSO's obligation is general diligence rather than to meet specific timelines.

The NBSO publishes a listing of completed System Impact Studies and of queued System Impact Studies at:

www.nbso.ca/Public/en/op/transmission/connecting/application.aspx.

1.3.3 Renewable Energy Market in New Brunswick

There are a variety of ways for renewable energy developers to enter the market for renewable electricity in New Brunswick. The following is a brief description of these opportunities:

- Net metering – NB Power has created policy to accept this form of energy input (see Section 1.3.5.1).
- Embedded Generation Sales– NB Power has created a policy for Embedded Generation (see Section 1.3.5.2).
- Power purchase agreement with NBPD&CS to meet Renewable Electricity Targets; historically these agreements have been procured through a Request for Proposal (RFP) process.
- Sales to Municipal Utilities and Industrial Customers – these Market Participants are for the most part served by the standard service provider, but have the option to receive services from competitive suppliers.
- Export sales – generators may sell directly to export markets, or through NBSO to gain access to these markets. The electricity has to be sold into the ISO - New England grid in order to sell a REC (more on RECs in 2.10.2.3).
- Markets for renewable thermal energy also exist but are less developed.

1.3.4 Existing Electrical Transmission and Generation System

1.3.4.1 Transmission

The New Brunswick transmission system is very robust with generation dispersed at different system locations and sufficient transmission capacity to economically dispatch energy to meet all in-province loads and export commitments. Congestion is a situation where there is insufficient transmission capacity to meet a particular load opportunity. It is rare in the NB Power internal system except under extreme contingency conditions. Electricity can generally be transmitted in substantial quantities in all directions within and beyond the province. Congestion can be a limiting factor with respect to transmission of electricty into southern New England and beyond.

Table 1.1 below outlines the interconnection capacity of New Brunswick's transmission system, as outlined by NBSO in their 2008 10-year report (NBSO 2008b).

Table 1.1 Interconnection Capacity of New Brunswick's Transmission System

Neighbouring System	Transfer Capability to New Brunswick (MW)	Transfer Capability from New Brunswick (MW)
Quebec	1000	720
New England	550†	1000
Nova Scotia	350††	300††
Prince Edward Island	124	222

Table 1.1 Interconnection Capacity of New Brunswick's Transmission System

Neighbouring System	Transfer Capability to New Brunswick (MW)	Transfer Capability from New Brunswick (MW)
Northern Maine	90	100
Eastern Maine	15	15

† transfer capability from New England varies according to New Brunswick's largest contingency, load levels in Maine, status of area 345 kV MVAR resources, and the generating status of units near Orrington, Maine.
†† transfer capability to and from Nova Scotia is constrained by the import and export limits of the Nova Scotia electricity system.

Planned transmission system upgrades up to 2018 are outlined in the NBSO 2008 10-year report (NBSO 2008b). As part of its participation in various studies, NBSO is currently (2008) undertaking scenario analyses to determine the most efficient expansion of the New Brunswick transmission system as may be necessary to accommodate increased exports to neighbouring markets. It is anticipated that NBSO will complete this study in early 2009.

1.3.4.2 *Generation*

The in-province electrical generating stations as of January 1, 2008 are listed in Table 1.2.

Table 1.2 New Brunswick Electrical Generating Stations – January 1, 2008

Plant	Type	Net Capacity (MW)	Ownership
Point Lepreau	Nuclear	558 (18-month Refurbishment Apr'08 – Nov '09)	NB Power Nuclear
Belledune	Coal	457	NB Power Generation
Coleson Cove	Oil	972	NB Power Generation
Dalhousie	Oil	299	NB Power Generation
Bayside	Natural Gas	263 (combined cycle)	Bayside Power LP
Grand Lake	Coal	57	NB Power Generation
Grand Manan	Diesel	29 (combustion turbine - CT)	NB Power Generation
Millbank	Diesel	396 (CT)	NB Power Generation
Ste Rose	Diesel	99 (CT)	NB Power Generation
Grandview	Natural Gas	90 (combined cycle cogeneration)	TransCanada Energy Ltd.
Frasers	Biomass	39	Fraser Papers Inc.
St. George	Hydro	15	J.D. Irving Limited
Musquash	Hydro	5	NB Power Generation
Mactaquac	Hydro	669	NB Power Generation
Beechwood	Hydro	112	NB Power Generation
Grand Falls	Hydro	66	NB Power Generation
Tobique	Hydro	20	NB Power Generation
Nepisiguit Falls	Hydro	11	NB Power Generation
Sisson	Hydro	9	NB Power Generation
Milltown	Hydro	4	NB Power Generation
Total Capacity	-	4,175	-

Source: NBSO 2008b

1.3.5 Scale of Generation

Jurisdictions may establish size classifications for electricity generating facilities (*e.g.*, large, medium, small and micro). This is not generally an issue in New Brunswick. However, for projects that produce

more than 3 MW (3,000 kW), there is a requirement to conduct a provincial environmental impact assessment (EIA). Therefore, in this province, renewable energy developments above this threshold could be considered large scale projects. Note that projects with a smaller capacity may also be provincially regulated. For example, a provincial EIA is also triggered if the project will affect a wetland greater than two hectares in size, and a Watercourse and Wetland Alteration Permit (WAWA) is required for work within 30 m of a watercourse or a wetland. Biomass combustion facilities are subject to the *Clean Air Act*.

To find out if your project can be connected directly to the distribution system, NB Power Distribution and Customer Service should be contacted. The Net Metering and Embedded Generation programs currently in place in New Brunswick are described briefly in the following sections. A few guidelines associated with regulatory issues, distribution and transmission within New Brunswick are provided in the following sections.

1.3.5.1 Net Metering

As permitted under the *Electricity Act*, NB Power has introduced a net metering program that allows customers to produce their own renewable energy by connecting a small generation unit (under 100 kW) to NB Power's distribution system. The energy must be compatible with Eco Logo™ certified standards. The connections must be approved by NB Power and carried out to standards that ensure the safety of NB Power personnel and contractors.

A "net meter" records both the electricity NB Power delivers to the customer, as well as the electricity NB Power receives back from customer's generation unit. The customer is then billed for any net amount of electricity consumed, and receives a credit for power sold into the grid. Any credits not used during the current billing period are carried forward to subsequent billing periods until March 31 each year, after which they are reduced to zero. The value of energy to the customer is their avoided retail price.

This program encourages decentralized generation and broad geographical distribution of renewable energy sources. However, because of its limit of 100 kW, the net metering program is generally of interest to residential and small commercial operations.

More information on NB Power net metering can be found at:

http://www.nbpower.com/html/en/conservation/renewable_projects/net_metering/net_metering.html

1.3.5.2 Embedded Generation

NB Power is required by the *Electricity Act* to purchase electricity from the owners of small to medium size generators that supply their energy directly to the distribution grid (as opposed to the higher voltage transmission grid). An Independent Power Producer (IPP) may connect a generation unit to the New Brunswick Power Distribution and Customer Service Corporation (NBPD&CS) grid and will be paid for the useful output of the generation unit. Before an embedded generation project is initiated, the IPP must consult with and make application to the NBPD&CS.

In deciding the output purchase price, NB Power will consider the contract term, type of generation, NBPD&CS's avoided energy cost, potential capacity deferral value (if applicable) and value for environmental attributes in their evaluation. However, it should be noted that the cost of any and all distribution system upgrades resulting from the addition of the embedded generation project is the full

responsibility of the IPP. The upgrades may include transformation, metering, line extension, line upgrades, line relocation, and any other upgrades to NBPD&CS's system that are a direct result of the project. Additional costs may include a distribution transformer, a sealed four-quadrant interval meter, and other associated equipment. If a price cannot be amicably negotiated, either party may apply to the Energy and Utilities Board for a determination of the rate.

1.3.6 Amendment to Municipalities Act

Local Government introduced amendments to the *Municipalities Act* in the legislature on May 15, 2008 to allow municipalities and rural communities to become generators of electricity, as defined in the *Electricity Act*. This change is an indicator of the evolving energy market in New Brunswick and the possibility for municipalities and rural communities to become involved in energy projects in a new way. This bill received Royal Assent, in June, 2008, and is anticipated that the regulations will be released and the changes proclaimed into law early in 2009.

These amendments will allow municipalities and rural communities to construct, own and operate a generation facility, to use the electricity for their own purposes, to sell it within the defined parameters as described in the *Electricity Act* and to sell the excess to NBP D&CS. It does not allow additional municipalities or rural communities to become distribution utilities and sell directly to customers.

The amendments will give municipalities and rural communities the ability to acquire land to carry out this activity, and enable them to join together or to join others to share the costs and benefits of electricity generation (Government of New Brunswick 2008).

Under this Bill, municipalities and rural communities will be allowed, as will other generators, to engage in three permissible activities:

- large scale generation projects connecting directly to the transmission system (e.g., a municipality could have a wind farm, or partner with others to have a wind farm, and sell the electricity by private contract to the NB Power Distribution and Customer Service Corporation (NBPD&CS), through a bilateral contract to another Market Participant, or to an export customer;
- embedded generation; and
- net metering.

1.4 General Renewable Project Flowchart

A flowchart illustrating the process that must be followed for the establishment of a renewable energy project connecting to the transmission system in New Brunswick is provided in Figure 2. A similar flowchart for a renewable energy project with a connection to a distribution system is provided in Figure 3. Some key environmental and land use considerations are included in Figure 2. However, it should be noted that these considerations, including separate approval process requirements, may apply to projects making a connection to either a distribution system or a transmission system.

These two diagrams are general in nature but illustrate the basic requirements for bringing a renewable energy project to the market. If it is a renewable electricity project that is to be connected to the distribution system, the developer must meet with the operator of the distribution system (NBP D&CS,

Saint John Energy, Edmundston Energy, Perth-Andover Electric Light Commission). If it is to be connected to the transmission system, the NBSO should be contacted to initiate the approval process. NBPT should also be contacted early in the planning process if they are to be involved as the transmission line owners.

A project risk assessment should be conducted by the project team to identify all potential administrative and regulatory requirements and the risk associated with the proposed project. The steps to address the highest risk and longest timeline requirements should be initiated as early as possible based on an assessment of project elements including but not limited to:

- project site conditions (such as potential environmental effects to habitat, flora, fauna, fisheries, water, air, zoning and land use, land ownership);
- environmental Assessment and other environmental permit requirements (Section 2.2-2.7); and
- road infrastructure requirements (Section 2.10).

Figure 2 Simplified Project Flow Diagram for Renewable Energy Projects in NB – Transmission System

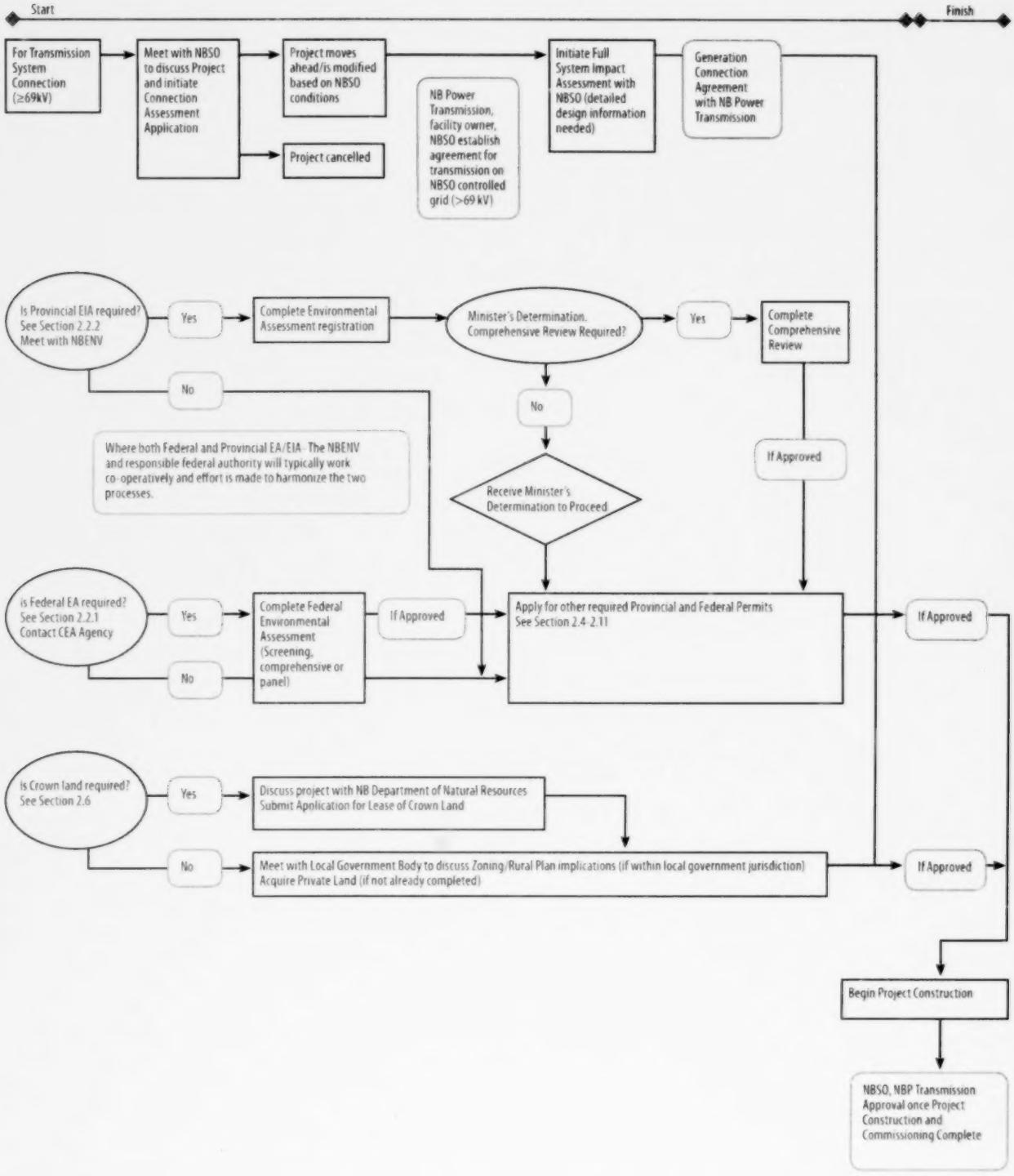
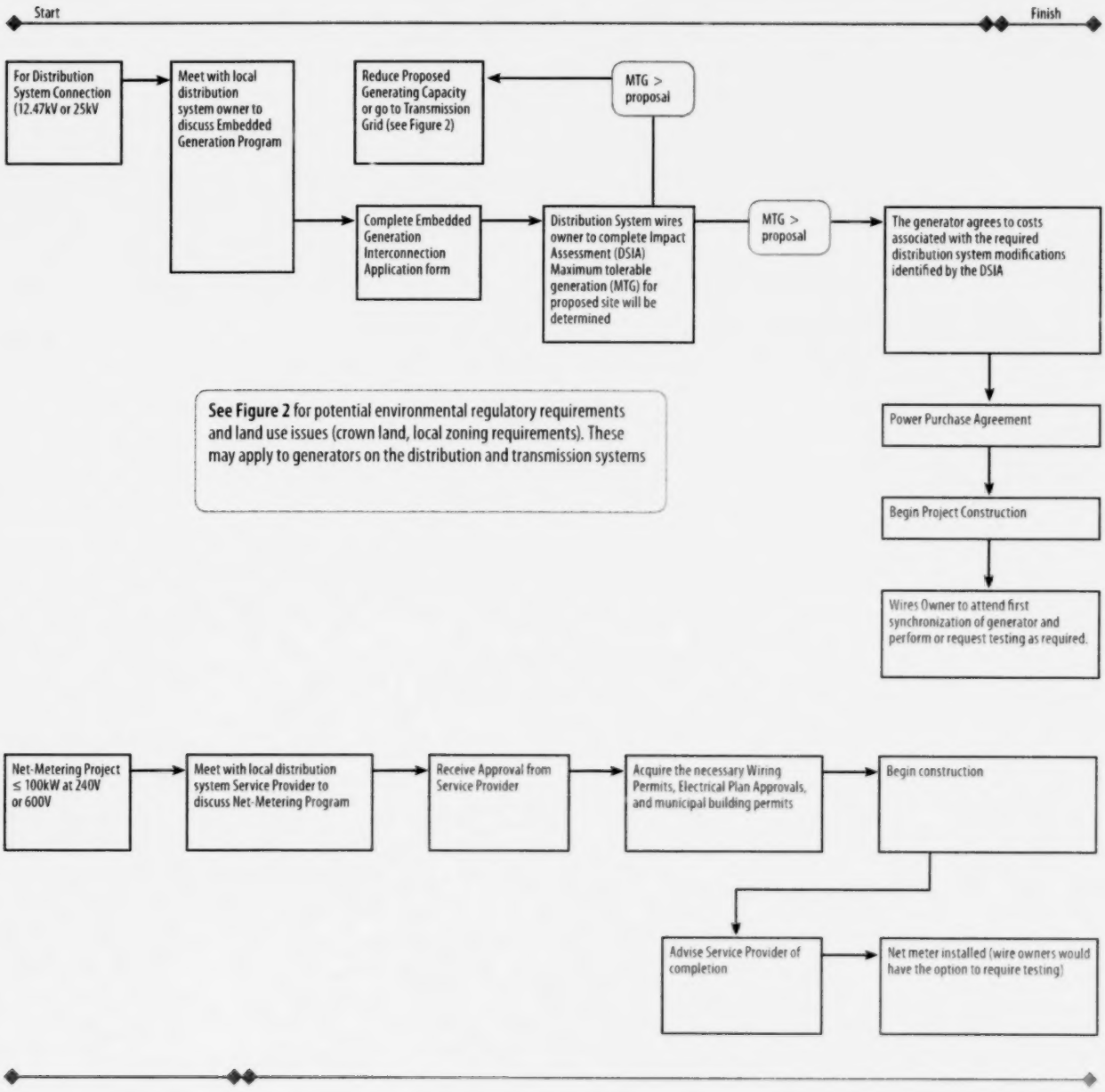

Start
Finish
For Transmission System Connection (≥69kV)
Meet with NBSO to discuss Project and initiate Connection Assessment Application
Project moves ahead/is modified based on NBSO conditions
Project cancelled
NB Power Transmission, facility owner, NBSO establish agreement for transmission on NBSO controlled grid (>69 kV)
Initiate Full System Impact Assessment with NBSO (detailed design information needed)
Generation Connection Agreement with NB Power Transmission
Is Provincial EIA required? See Section 2.2.2 Meet with NBENV
Yes
Complete Environmental Assessment registration
Minister's Determination. Comprehensive Review Required?
Yes
Complete Comprehensive Review
No
No
If Approved
Where both Federal and Provincial EA/EIA - The NBENV and responsible federal authority will typically work co-operatively and effort is made to harmonize the two processes.
Receive Minister's Determination to Proceed
is Federal EA required? See Section 2.2.1 Contact CEA Agency
Yes
Complete Federal Environmental Assessment (Screening, comprehensive or panel)
If Approved
No
Apply for other required Provincial and Federal Permits See Section 2.4-2.11
If Approved
Is Crown land required? See Section 2.6
Yes
Discuss project with NB Department of Natural Resources Submit Application for Lease of Crown Land
No
Meet with Local Government Body to discuss Zoning/Rural Plan implications (if within local government jurisdiction) Acquire Private Land (if not already completed)
If Approved
Begin Project Construction
NBSO, NBP Transmission Approval once Project Construction and Commissioning Complete

Figure 3 Simplified Project Flow Diagram for Renewable Energy Projects in NB – Distribution System


Start
Finish
For Distribution System Connection (12.47kV or 25kV
Meet with local distribution system owner to discuss Embedded Generation Program
Reduce Proposed Generating Capacity or go to Transmission Grid (see Figure 2)
MTG > proposal
Complete Embedded Generation Interconnection Application form
Distribution System wires owner to complete Impact Assessment (DSIA) Maximum tolerable generation (MTG) for proposed site will be determined
MTG > proposal
The generator agrees to costs associated with the required distribution system modifications identified by the DSIA
See Figure 2 for potential environmental regulatory requirements and land use issues (crown land, local zoning requirements). These may apply to generators on the distribution and transmission systems
Power Purchase Agreement
Begin Project Construction
Wires Owner to attend first synchronization of generator and perform or request testing as required.
Net-Metering Project ≤ 100kW at 240V or 600V
Meet with local distribution system Service Provider to discuss Net-Metering Program
Receive Approval from Service Provider
Acquire the necessary Wiring Permits, Electrical Plan Approvals, and municipal building permits
Begin construction
Advise Service Provider of completion
Net meter installed (wire owners would have the option to require testing)

2.0 REGULATORY REQUIREMENTS

There are a number of regulatory requirements, including both federal and provincial regulations and local municipal by-laws, that renewable energy developers should be aware of for the planning and execution of their projects. Some of these pertain to a broad range of major developments, such as environmental assessments or occupational health and safety, while others pertain to specific situations, such as development in navigable waters. The relevant and important regulations and acts that define the constraints of development and opportunities for operational improvements are summarized in this chapter. It should be noted that early discussions with relevant departments and agencies can assist in identifying specific requirements for your project. Further details regarding the applicability of regulations to specific renewable energy sources are provided in Chapter 3.

2.1 Overview of Regulatory Authorities

The regulatory authorities which would typically govern the planning and approval stages of a renewable energy project within New Brunswick are provided in Table 2.1. The departments that would be involved with any given project would depend on the location and scope of the project.

Table 2.1 Regulatory Authorities for New Brunswick

Department or Agency	Primary Mandate, or Specific Area(s) of Focus
Federal	
Fisheries and Oceans Canada	Fish and fish habitat; fish passage, mortality
Transport Canada	Navigable waters; marine safety; aviation safety
Environment Canada	Ocean dredging and disposal at sea; various environmental quality concerns (*e.g.*, air quality, climate change); deleterious substances; migratory birds; species at risk
Health Canada	Public health
Natural Resources Canada	Climate change, energy policy.
National Energy Board	Energy transmission and sale inter-provincially and internationally
Canadian Environmental Assessment Agency	Federal Environmental Assessment Coordinator (FEAC)
Canadian Broadcasting Corporation	Communications equipment, including transmission towers
Department of National Defence	Military and Air Force bases; communication equipment
Provincial	
New Brunswick Department of Environment	Various branches of the department, with varying responsibilities for administration of provincial environmental and land use planning legislation
New Brunswick Department of Natural Resources	Fish and wildlife; Crown lands; Endangered species
New Brunswick Department of Local Government	Advice to municipalities, rural communities and local service districts
New Brunswick Department of Health	Public health
New Brunswick Department of Public Safety	Provincial building, electrical, plumbing, and pressure vessel codes; public safety; emergency services
New Brunswick Department of Energy	Pipelines, electricity, refined petroleum products, natural gas, indigenous resources, energy efficiency, energy policy
New Brunswick Department of Fisheries	Commercial fisheries
New Brunswick Department of Tourism and Parks	Tourism and recreation
New Brunswick Energy and Utilities	Regulation of electricity, petroleum

Table 2.1 Regulatory Authorities for New Brunswick

Department or Agency	Primary Mandate, or Specific Area(s) of Focus
Board	
New Brunswick Aboriginal Affairs Secretariat	Administration of Aboriginal Affairs in New Brunswick
New Brunswick Department of Transportation	Road infrastructure; special load and vehicle permits
New Brunswick System Operator	Direct the operation of the transmission grid; reliability; administration of the Open Access Transmission Tariff; market administration
New Brunswick Museum	Palaeontological resources
New Brunswick Workplace Health and Safety Commission	Occupational health and safety
New Brunswick Department of Wellness, Culture and Sport	Heritage and archaeological resources
Local Governments	
Municipalities, Rural Communities, Unincorporated Areas	Municipal development; zoning; building permits

There are a number of federal and provincial laws and regulations which may be applicable to potential renewable energy development in the province of New Brunswick. A summary of key federal and provincial legislation and how they may apply to a renewable energy development is provided in Table 2.2. The legislation is then presented in separate sections by category including the environment, energy, and employment.

Table 2.2 Summary of Legislation that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Application to the Project	Activity or Component
Federal			
Canadian Environmental Assessment Act	Fisheries and Oceans Canada, Transport Canada, Environment Canada, Canadian Environmental Assessment Agency	Federal EA approval from responsible authorities, where triggered	Construction, operation, and decommissioning of a project as defined under *CEAA*, where triggered by funding, transfer of land, or *Law List Regulations*
Canadian Environmental Protection Act	Environment Canada	Release of toxic substances S. 95; Production, import, or selling of fuel with specific requirements S. 139 (1); Air pollutants S. 167, 171; Water pollutants S.177, 181.	Hazardous material and POL storage, NPRI Reporting, Environmental Emergencies Regulations, Ocean Dredging and Disposal permit for dredging. NOTE: Likely to be additional requirements or opportunities to create Carbon Offset Credits under the "Turning the Corner" program.
Fisheries Act	Fisheries and Oceans Canada, Environment Canada	Fish passage (S.20) HADD authorization (S. 35(2); Authorization for destruction of fish (S. 32); Authorization for deleterious substances (S. 36)	Construction and operation of water based infrastructure; operation of cooling water intake structure; release of wastewater (all are *CEAA Law List Regulations* triggers)
Navigable Waters Protection Act	Transport Canada	NWPA permit under S. 5(1)(a) and 6(4) to allow for an interference to navigation; Disposal of waste S. 21	Works or construction activity in navigable waters (both are *CEAA* triggers)
Navigable Water Works Regulation	Transport Canada	Maintain access to work, and keep records of water flow and level S. 7	Construction and maintenance of a dam or power plant in navigable water

Table 2.2 Summary of Legislation that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Natural and Man-made Harbour Navigation and Use Regulations	Transport Canada	Obstruction, interference, diversion or otherwise negatively affect a harbour S. 3	Construction, operation or decommissioning of facility in a harbour
Migratory Birds Convention Act	Environment Canada	Possess or otherwise use a migratory bird nest S. 5; Use of substances harmful to migratory birds S. 5.1; destruction or harm of the individual, eggs or young	Construction of facilities, particularly from disturbance during clearing and site preparation
Species at Risk Act	Fisheries and Oceans Canada, Environment Canada	Kill, harm, possess, buy/sell an endangered species, or damage or destroy its residence S. 32, 33, 36	Construction of facilities, particularly from disturbance during clearing and site preparation
Canada National Marine Conservation Areas Act	Environment Canada	Use or occupancy of public lands S.12; Exploration and Exploitation for minerals, etc. S. 13; Disposal of substances S. 14; Pollution Clean-up S. 29.	Works or construction activity in conservation waters
Canada Water Act	Environment Canada	waste disposal in the water quality management area S. 9	Shipping, work, or construction activities in Canadian waters
Canada Shipping Act and Regulations	Transport Canada	--	Shipping activities during construction and operation
Canadian Aviation Regulations	Transport Canada	Project marking or site location	Addition of lighting to wind turbines, distance from airports
National Energy Board Act	National Energy Board	Export of electricity S. 119.02	Transmission of electricity for export purposes (internationally or inter-provincially)
National Energy Board Export and Import Reporting Regulations	National Energy Board	Export of energy, with information on amount, finances, and customer details S. 8	Exporting energy
National Energy Board Electricity Regulations	National Energy Board	International electricity exports and international power lines	Distribution of electricity internationally
Canada Marine Act	Transport Canada	S. 56 – Clearance to Enter Waters of a Port; S. 27 may require authorizations for specified activities such as travelling through or docking at a federal port	Shipping Anchorage, berthing, and deberthing activities during construction and operation.
National Building Code; National Fire Code; National Plumbing Code; National Energy Code for Buildings	National Research Council, Natural Resources Canada	Building, fire, plumbing, and electrical permits	Construction and operation of a project

Table 2.2 Summary of Legislation that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Explosives Act	Natural Resources Canada	S. 7(b) and S. 9 require a permit for the transportation of explosives and importation of explosives	Temporary magazine license for blasting during site preparation (*CEAA* trigger)
Provincial			
Environmental Impact Assessment Regulation – Clean Environment Act	NB Department of Environment	Approval of the Undertaking	Construction, operation, modification, decommissioning and abandonment of an undertaking (project) (if included in Schedule A)
Air Quality Regulation – Clean Air Act	NB Department of Environment	Section 3(1)(a) Approval to Construct and Approval to Operate a Source; S. 14 Approval to release smoke	Construction of air contaminant emission source; Operation of air contaminant emission source.
Water Quality Regulation – Clean Environment Act	NB Department of Environment	S. 3(2) Discharge into waters of the Province; S. 3(3) Approval to Construct and Approval to Operate for the wastewater treatment system; S. 3(4) Sewage work and approval to discharge; S. 3(5) Approval for construction/operation of waterworks; S 3(6) Connecting to a municipal water system	Construction (site run-off); Operation of wastewater treatment, cooling water, and sanitary wastes systems; Construction and Operation of water mains; Withdrawal of water during construction and operation.
Clean Water Act and Regulations (including *Watercourse and Wetland Alteration Regulation*)	NB Department of Environment	S. 12(1) Release of contaminant into or upon water; S. 15(1)(b) Permit for a Watercourse and Wetland Alteration	Project requiring watercourse or wetland alteration or within 30 m of a watercourse or wetland
Protected Natural Areas Act	NB Department of Natural Resources	S. 11 Prohibition of activities in Class 1 Protected Natural Areas S. 12 Prohibition of activities in Class 2 Protected Natural Areas	Construction or operation of a project in protected areas
Electricity from Renewable Resources Regulation - Electricity Act	NB Department of Energy	Generation of renewable sources of energy S. 4	Construction of a new energy generation facility
Transportation of Primary Forest Products Act	NB Department of Natural Resources	Operating, importing or exporting a vehicle with primary forest products S. 2	Forestry or food products development
Forest Products Act	NB Department of Natural Resources	S. 12(2) Forest Industries, consumers and producers to report on operations	Operations and production of forest products

Table 2.2 Summary of Legislation that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Crown Lands and Forests Act (including Leasing Regulation and Timber Regulation)	NB Department of Natural Resources	Lease of Crown land	Use of Crown lands or forests
Petroleum Product Storage and Handling Regulation – Clean Environment Act	NB Department of Environment	S. 23(1) Installation of a petroleum storage tank	Construction and Operation of petroleum storage systems
Ozone Depleting Substances and Other Halocarbons Regulation – Clean Air Act	NB Department of Environment	S. 4 Release or use of ozone depleting substances; S. 14 Record keeping and reporting for ozone depleting substances; S.15 maintenance requirements for equipment containing ozone depleting substances	Construction and operation of refrigeration, air conditioning, and fire suppression systems associated with the facilities
Topsoil Preservation Act	NB Department of Environment	Removal of topsoil S. 2, 3, & 4	Construction and operation of a development
Employment Standards Act	NB Department of Post –Secondary Education, Training and Labour	--	Construction and operation of a Project
Fire Prevention Act Section 23 (c)	NB Department of Public Safety	--	Fire prevention, control, and response systems
Occupational Health and Safety Act and Regulations	NB Department of Post –Secondary Education, Training and Labour	S. 8 and S. 17(2) require a Health and Safety Policy; Workplace standards, WHMIS, first aid providers, etc.	Construction and operation of a Project
Provincial Building Regulation – Community Planning Act	NB Department of Local Government	Building permits	Construction and operation of a Project
Boiler and Pressure Vessel Act	NB Department of Public Safety	S. 13 requires certificate of inspection; S. 113(1) requires permit to install boilers or pressure vessels	Construction and operation of boilers and pressure vessels
Electricity Act and Regulations	NB Department of Energy	S. 86 Owning or operating an electricity transmission system	Delivery of electricity from energy project
Endangered Species Act	NB Department of Natural Resources	S. 3 Kill, injure, disturb an endangered species, or destroy or disturb their shelter or habitat	Construction of facilities, particularly from disturbance during clearing and site preparation
Electrical Installation and Inspection Act and Regulations	NB Department of Public Safety	S. 4(1) requirement to meet electrical installation standards, Approval for electrical installation	Construction and operation of a Project

Table 2.2 Summary of Legislation that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Transportation of Dangerous Goods Act	NB Department of Public Safety	Permit may be required for transportation of goods listed in Schedule A of the Act	Transportation of dangerous goods, including hazardous materials
Motor Vehicle Act	NB Department of Public Safety	Special Permits for moving large structures	Transporting large structures or masses on NB highways
Highway Act, Highway Usage Regulation	NB Department of Transportation	Application for public property easements	Installation of utility lines along public highways
Community Planning Act, Local Service District Basic Planning Regulations	NB Department of Environment	Planning Approval/Change in Zoning	Construction within local government jurisdiction, or within Local Service Districts
Local Governments			
Local Government By-Laws	Applicable Local Government	Planning Approval/Change in Zoning	Construction within local government jurisdiction
Rural Plans, Development Plans	Applicable Local Government	Building permits	Construction of structures within local government jurisdiction

Provincial Acts and Regulations can be downloaded from the Government of New Brunswick website at: http://www.gnb.ca/0062/acts/acts-e.asp. Federal Acts and Regulations can be accessed on-line at: http://laws.justice.gc.ca/en.

Many of the general regulations affecting development have to do with environmental preservation and protection. These regulations are related to pollution, endangered species, or restrictions on areas of development. Depending on how the development is constructed, where it is placed, and how it is operated, various regulations may pertain to and could potentially limit development options. This section will cover the provincial and federal environmental assessment processes as well as other regulations including those for water, air, land, and flora and fauna.

2.2 Environmental Assessment

An environmental assessment (environmental impact assessment in provincial legislation) is a planning tool used by the provincial and federal governments to ensure that the adverse environmental effects of proposed projects are identified and mitigated where possible. Ideally, the assessment of environmental effects and provision for mitigation is an integral part of the project planning process.

If your project is subject to a provincial *Environmental Impact Assessment Regulation* and it is also subject to the federal *Canadian Environmental Assessment Act*, requirements must be met for both before any other permits are obtained.

In most provinces, formal cooperative agreements between the federal and provincial governments have been established so that projects subject to both federal and provincial environmental assessments are assessed under one process. Where such agreements have not yet been established, federal and provincial governments typically cooperate informally to ensure coordination of environmental assessment processes. New Brunswick does not currently have a formal agreement in

place. However, the requirements of both processes are similar in many respects. The NBENV and the responsible federal authority typically work co-operatively and effort is made to harmonize the information requirements to serve both processes.

2.2.1 Federal Environmental Assessment

The *Canadian Environmental Assessment Act* (*CEAA*) is a federal law that requires federal decision makers (i.e., "responsible authorities") to consider the environmental effects of proposed projects before taking any actions that would allow your project to go ahead. A responsible authority may not do anything to permit a project to be carried out until all significant adverse environmental effects have been addressed. The following guidance has been adapted from information provided on the Canadian Environmental Assessment Agency (CEA Agency) website, www.ceaa.gc.ca. (CEA Agency 2008)

A flowchart to determine whether the *CEAA* applies to a project is shown as Figure 4. In order for the *CEAA* to apply to your project, the following criteria must be met:

Project: Your project must be an undertaking in relation to a physical work or be a physical activity listed in the *Inclusion List Regulations*.

Excluded Projects: If your project is listed in the *Exclusion List Regulations* or is in response to special emergency situations, the *CEAA* does not apply.

Federal Authority: There must be a federal authority that has specific decision-making responsibility associated with your project.

Triggers: Triggers are powers, duties or functions (e.g. issuing permits, granting approvals, or providing funding) performed by a federal authority that require it to conduct an environmental assessment under the CEAA.

Under the *CEAA* subsection 2(1), a project is defined as:

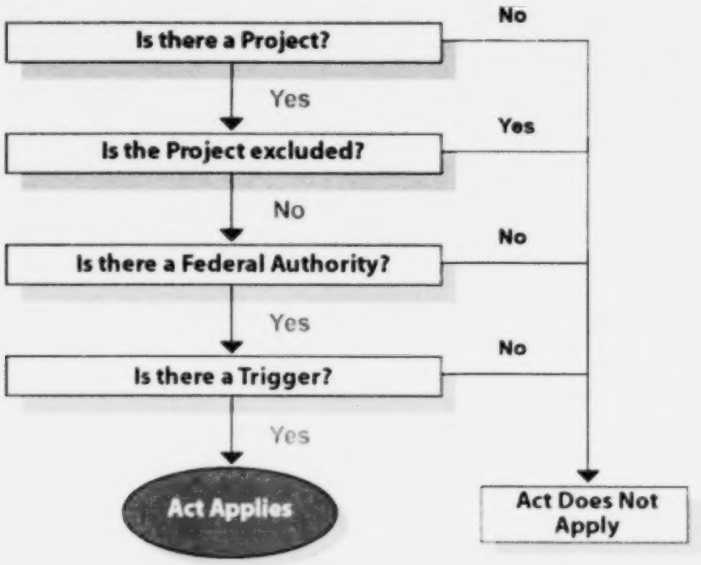
- any proposed undertaking in relation to a physical work; or
- any proposed physical activity not relating to a physical work that is set out in the *Inclusion List Regulations*.

The first category of the definition, an undertaking in relation to a physical work, covers most projects that fall under the Act.

A "physical work" is something that has been or will be constructed (human-made) and has a fixed location. Examples include a bridge, building, generating station or pipeline, but do not include airplanes or ships at sea (not fixed).

"Undertakings" associated with the physical work consist of all of the various steps of the life cycle of the physical work. Examples include construction, operation, modification, decommissioning and abandonment. (*CEAA*)

Figure 4 Canadian Environmental Assessment Act Flowchart



The second category of the definition of project covers physical activities not relating to a physical work. These are listed in the *Inclusion List Regulations*. Examples include various activities in National parks and protected areas (Part I) and various activities associated with fisheries (Part VII) and flora and fauna (Part VIII) as well as others. This category seeks to bring into the EA process certain activities that have the potential for significant adverse environmental effects (if not mitigated).

The construction of any renewable energy facility would be considered an undertaking (construction and subsequent operation) in relation to a physical work (constructed in a fixed location) and would, therefore, be a project under *CEAA*. Thus, if there is a trigger such as federal funding, federal authorization or federal land required for the project, an environmental assessment (EA) under *CEAA* would be required.

The actions or steps required if a project is determined to require an EA are summarized in Table 2.3.

Table 2.3 Steps for Completion of a Federal Environmental Assessment

Steps in Completing an Environmental Assessment	Responsible Party
Confirm applicability of the Act by contacting the Agency or the potential responsible authority(ies)	▪ **Proponent**
Prepare and submit a project description to the Agency or the most likely responsible authority(ies) if required; for major natural resource projects the project description is filed with the Major Projects Management Office.	▪ **Proponent**
Identify the responsible authority(ies) and expert departments for the environmental assessment in accordance with *Federal Coordination Regulations*	▪ Federal government

Table 2.3 Steps for Completion of a Federal Environmental Assessment

Steps in Completing an Environmental Assessment	Responsible Party
Identify the type of environmental assessment - screening, class screening, comprehensive study, assessment by a review panel, or mediation	▪ Federal government
Determine the project information to be inserted into the Canadian Environmental Assessment Registry (the Registry)	▪ Federal government
Identify the scope of the environmental assessment	▪ Federal government ▪ If a **proponent** is preparing the environmental assessment documentation, it must conform to the scope of the environmental assessment, as prescribed by the federal government
Complete the environmental assessment considering environmental factors listed in the *Act*	▪ Federal government ▪ **Proponent**'s environmental assessment documentation must include the environmental factors
Environmental assessment decision	▪ Federal government
Further assessment by a review panel or mediation (if required)	▪ Federal government ▪ **Proponent** provides information as requested, and participates in the assessment by the review panel or mediation

2.2.1.1 Federal Coordination

Federal coordination in respect of the requirements for an EA under *CEAA* is initiated by filing a Project Description with a Federal Authority (FA) or the CEA Agency. The coordination is governed by the *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements* ("Federal Coordination Regulations" or "FCR"). Federal agencies are obliged under the Federal Coordination Regulations to determine if an EA is required under *CEAA*, and if they are a Responsible Authority (RA) or a FAwith specialist information, when they receive a project description from a province. The process will then determine if *CEAA* is triggered and the potential role of FAs in respect of the EA.

The CEA Agency is the federal coordinating agency for all comprehensive studies and multi-jurisdictional EA under *CEAA*. The following FAs are often RAs for the EA under *CEAA* for renewable energy projects (depending on the type and scope of the project).

- The Department of Fisheries and Oceans (DFO) will be a RA if there are *Fisheries Act* triggers (e.g., tidal power project, hydroelectric project).
- Transport Canada will likely be a RA in marine related projects as well as for projects involving water crossings (projects involving navigable waters).
- Natural Resources Canada (NRCan) could be a RA if the *Explosives Act* is triggered (blasting during construction) or if federal funding from the ecoENERGY for Renewable Power Program or from another federal incentive within NRCan's mandate is provided.

- Environment Canada could be a RA if ocean dredging and disposal is required.

Other FAs, such as Environment Canada, Health Canada, Indian and Northern Affairs Canada, and Natural Resources Canada, may provide expert advice during an EA even if they are not designated as a RA.

2.2.1.2 Federal Coordination of Major Projects

In March 2008, the Major Projects Management Office (MPMO) was opened under the authority of NRCan. The MPMO is a Government of Canada organization whose main roles are to provide overarching project management and accountability for major resource projects in the federal regulatory review process (under *CEAA*), and to facilitate improvements to the regulatory system for major resource projects.

The MPMO was established to improve the performance of the federal regulatory system for major natural resource projects, in collaboration with other federal departments and agencies.

The MPMO's main roles/responsibilities include:

- to provide a single point of entry into the federal regulatory system for proponents of major resource projects;
- to engage in early discussions, distribution of guidance materials and information exchanges with proponents on proposed projects;
- to develop in collaboration with relevant federal departments and agencies, consensus-based Project Agreements that articulate the roles and responsibilities of each department and timeline-based performance targets for delivery of process milestones;
- to track and monitor the Crown's Aboriginal Consultation requirements related to the review of major resource projects and maintain the official record of Aboriginal/Crown consultation for the Government of Canada;
- to implement and manage a transparent monitoring and tracking system for major resource projects as a mechanism with which to monitor and track the progress of any specific project through the regulatory process; and
- to lead collaborative research and policy analysis on short, medium and longer term initiatives to improve the performance of the regulatory system-including legislative options, cost recovery, cumulative effects, energy infrastructure corridors, regional assessment and capacity building initiatives/processes.

The "*Cabinet Directive on Improving the Performance of the Regulatory System for Major Resource Projects*" defines a Major Resource Project as a large resource project which is subject to a comprehensive study, a panel review, or a large or complex multi-jurisdictional screening, as defined under the *CEAA*. Resource sectors that will be considered may include mineral and metal mining, oil sands development and processing, and electricity generation and transmission.

There is no legal requirement for proponents of major resource projects to engage the MPMO for their projects but they are encouraged to do so. Early engagement will allow the MPMO to provide proponents with necessary early guidance on information requirements and Aboriginal consultation that will facilitate an improved regulatory process.

The MPMO will not replace or duplicate the CEA Agency's role in coordinating environmental assessments. The MPMO is intended to work closely with the CEA Agency on key aspects of each project review from the pre-environmental assessment phase to the full EA stage, to regulatory permitting and authorizations required for operations to commence, through to follow-up monitoring. MPMO officials can be reached via email at mpmo@nrcan.gc.ca and more information can be found at http://www.mpmo-bggp.gc.ca.

2.2.1.3 CEAA Screening Report

When the *CEAA* is triggered, all EAs under *CEAA* are "screenings" unless the project is on the *Comprehensive Study List Regulations* or it is referred to a mediator or review panel by the Minister of Environment. Comprehensive studies and panel reviews are discussed later. The following discussion focuses on the process for a screening.

The determination of the requirement for an EA under *CEAA* is determined based on a project description filed by the proponent with a FA or the CEA Agency.

Typically, the proponent (or a consultant on behalf of the proponent) prepares the draft screening report. The draft screening report is reviewed by the RA and may require iteration before it is accepted as final. The screening report must be publicly released for review (if the RA has determined that public consultation is required). The RA addresses the public comments and issues a final screening decision, normally within about one month of the completion of the public review period.

2.2.1.4 *CEAA* Comprehensive Study

If the *CEAA* is triggered, the *Comprehensive Study List Regulations* describe those types of projects that must be assessed through a more detailed study, and identifies those types of projects that, if triggered, require as a minimum a comprehensive study (and not the less comprehensive "screening").

Listed below are selected project thresholds for comprehensive studies that may apply to renewable energy projects:

2. The proposed construction, decommissioning or abandonment, in a wildlife area or migratory bird sanctuary, of (a) an electrical generating station or transmission line; (b) a dam, dyke, reservoir or other structure for the diversion of water; (f) an industrial facility; or (k) a waste management facility.

4. The proposed construction, decommissioning or abandonment of (b) a hydroelectric generating station with a production capacity of 200 MW or more.

5. The proposed expansion of (b) a hydroelectric generating station that would result in an increase in production capacity of 50 per cent or more, and 200 MW or more.

6. The proposed construction, decommissioning or abandonment of a tidal power electrical generating station with a production capacity of 5 MW or more, or an expansion of such a station that would result in an increase in production capacity of more than 35 per cent.

7. The proposed construction of an electrical transmission line with a voltage of 345 kV or more that is 75 km or more in length on a new right of way.

8. The proposed construction, decommissioning or abandonment of a dam or dyke that would result in the creation of a reservoir with a surface area that would exceed the annual mean surface area of a

natural water body by 1500 hectares or more, or an expansion of a dam or dyke that would result in an increase in the surface area of a reservoir of more than 35 per cent.

9. The proposed construction, decommissioning or abandonment of a structure for the diversion of 10 000 000 m^3/a or more of water from a natural water body into another natural water body or an expansion of such a structure that would result in an increase in diversion capacity of more than 35 per cent.

10. The proposed construction, decommissioning or abandonment of a facility for the extraction of 200 000 m^3/a or more of ground water or an expansion of such a facility that would result in an increase in production capacity of more than 35 per cent.

Comprehensive studies involve some additional factors to be considered over that required for screening reports, including the purpose of the project and alternative means of carrying out the project. As well, the decision-making and public consultation requirements are more and timeframes are longer.

Comprehensive Study Track Decision

Under the *CEAA*, where a project is described in the *Comprehensive Study List Regulations*, the Minister of Environment has the authority to decide, on the advice of the RA, whether the EA should be continued by means of a comprehensive study, or whether the project should be referred to a mediator or review panel. If the Minister of Environment decides that the project should continue as a comprehensive study, the project cannot be referred to a mediator or review panel at a later date. This "study-track decision" represents the final scope determination for the project if it is not referred to a review panel and governs the EA.

If the Minister of Environment determines that the EA will continue as a comprehensive study, a comprehensive study report (CSR) will be prepared. Upon acceptance by the RA, the CSR would be submitted to the Minister of Environment and the CEA Agency. The RA must ensure there are opportunities for public participation during the comprehensive study process. Completion of the EA is often delegated to the proponent under Section 17 of *CEAA*. A separate CSR is sometimes prepared by the RA using the proponent report as the basis. There is little consistency among RAs in this regard. The only aspect that cannot be delegated to the proponent is the actual decision-making.

Following submission and acceptance of the CSR, the CEA Agency will invite the public to comment on the report prior to the Minister of Environment making a determination. There are no timelines but the CEA Agency targets, as a matter of policy, to complete this review and decision within 60 days of the acceptance of the CSR for public review. The Minister of Environment may request additional information or require that public concerns be further addressed before issuing the EA decision statement. Once the EA decision statement is issued, the Minister will refer the project back to the RA for action.

2.2.1.5 Referral to a Review Panel

At any time, the Minister of the RA or the Minister of Environment can refer a project to a review panel, except where a comprehensive study-track decision has been made to not refer the project to a review panel.

It is critical to recognize that, even if *CEAA* was not triggered, the Minister of Environment may determine that there are trans-boundary environmental effects that could be significant. This could

occur, for example, based on flooding for a hydro project outside of the province or country, or potential for a project to influence fisheries in another province or country. In that case, even if *CEAA* was not triggered, the Minister can refer the Project to a review panel.

Where a project is referred to a review panel, the Minister of Environment, in consultation with the RA, sets the Terms of Reference (TOR) for the review panel. The review panel conducts the environmental assessment and reports back to the Minister for a decision. The process is longer and involves more public consultation.

2.2.1.6 First Nations consideration

A consideration for developers in regards to the *CEAA* is the inclusion of First Nations' viewpoints on land and resource use. Under the *CEAA*, there is no explicit requirement to consult First Nations. However, according to Section 2, b (iii), of the *CEAA*, an environmental effect, the subject of an EA, is a change that the project may have on the environment, including a change to the "*current use* of lands and resources for traditional purposes by aboriginal persons" (emphasis added).

Unless explicitly required by the RA pursuant to the authority afforded under Section 16(1)(e) of *CEAA*, the past use is not a subject that requires consideration by proponents or the RA. Hence past or "traditional" use of land and resources is not under the purview of the *CEAA* unless the RA exercises discretion pursuant to Section 16(1)(e) to require it. RA may consider traditional knowledge in conducting an EA.

The RA, however, is responsible to consider whether or not a decision in respect of the project would result upon an infringement of the rights of aboriginal people as protected under the *Constitution Act*. Hence, matters related to past land and resource use may be relevant for decision makers, irrespective of the requirements of *CEAA*.

2.2.2 Provincial Environmental Impact Assessment

The New Brunswick *Environmental Impact Assessment Regulation* (EIA Regulation) came into force in 1987 under the *Clean Environment Act*. The EIA Regulation requires that the proposed construction, operation, modification, extension, abandonment, demolition or rehabilitation of certain projects or activities, described in Schedule "A" of the Regulation, must be registered. Schedule "A" of the EIA Regulation identifies 24 categories of projects or activities (referred to as undertakings) which must be registered.

2.2.2.1 Projects or Undertakings Which Require Assessment

The following are types of projects or triggers for the EIA process which may relate to renewable energy projects (as listed in Schedule A):

(b) all electric power generating facilities with a production rating of three (3) megawatts or more;

(c) all water reservoirs with a storage capacity of more than ten (10) million cubic metres;

(d) all electric power transmission lines exceeding sixty-nine thousand volts (69 kV) in capacity or five (5) kilometres in length;

(f) all commercial extraction or processing of combustible energy-yielding materials, except fuelwood;

(h) all pipelines exceeding five (5) kilometres in length, except water, steam or domestic wastewater pipelines *and* pipelines or pipe lines that are the subject of an application under the *Gas Distribution Act* or the *Pipe Line Act*;

(m) all waste disposal facilities or systems;

(m1) all disposal, destruction, recycling, reprocessing or storage of waste that originates outside New Brunswick and all facilities or, systems for the disposal, destruction, recycling, reprocessing or storage of such waste;

(n) all sewage disposal or sewage treatment facilities, other than domestic, on-site facilities;

(r) all projects involving the transfer of water between drainage basins;

(s) all waterworks with a capacity greater than fifty (50) cubic metres of water daily;

(u) all enterprises, activities, projects, structures, works or programs affecting any unique, rare or endangered feature of the environment;

(v) all enterprises, activities, projects, structures, works or programs affecting two (2) hectares or more of bog, marsh, swamp or other wetland.

Some of these triggers are straightforward to identify while others require some site specific analysis (e.g., unique, rare features or the presence of a wetland).

2.2.2.2 Overview of the New Brunswick EIA Process

The EIA Regulation is designed to identify the environmental impacts associated with development proposals well in advance of their implementation, so that such impacts can be avoided or reduced to acceptable levels before they occur. An EIA gives technical specialists from government departments and agencies, as well as local residents and the general public, a chance to provide their input to the decision-making process regarding specific development proposals. The EIA review process must be completed before any project subject to EIA can proceed. Although the EIA Regulation grants the Lieutenant-Governor in Council the authority to prevent projects from proceeding, it is not intended to be a mechanism for stopping developments for which the anticipated impacts can be avoided or reduced to acceptable levels through mitigation.

Under the EIA Regulation, individuals, companies or public sector agencies that propose certain types of projects (listed as Undertakings in Schedule "A" of the EIA Regulation) are required to register information about the proposal with the Department of Environment (NBENV), at an early stage in the planning. The requirement for registration also includes projects that would modify, rehabilitate, extend, abandon or demolish previously approved "Schedule A" undertakings, including those that were completed before the Regulation came into force. This may apply for example to the rehabilitation of an old hydroelectric facility.

The NBENV has developed "A Guide to Environmental Impact Assessments in New Brunswick" (NBENV 2005) that identifies what information must be included in an EIA registration as well as registration fees for the various types of projects. As stated in the NBENV guide, there is some flexibility in these requirements depending on the type of project:

"The Project Assessment and Approvals Branch has the ability to waive certain information requirements deemed not applicable (e.g., a reduced description of environmental features may be

allowed for projects that will be located within an area of existing development as opposed to a "green field" site). Further to the above, if a proponent feels that any of the information requirements listed in this guide are not applicable for a particular project the proponent should clearly state that the requirement is not applicable and provide justification. It is advisable to discuss this with the Project Assessment and Approvals Branch in advance of submission." (NBENV 2007)

The basic flow of the provincial EIA process is as follows.

- project is registered and undergoes a "Determination Review"
- public consultation is conducted during determination review process;
- technical Review Committee (TRC) reviews the registration and provides any questions within 30 days of registration date;
- proponent responds to questions and comments from the TRC; and
- once questions are adequately addressed Minister has 30 days to make a decision regarding whether the project is approved with conditions, not approved or must undergo further review (a "Comprehensive Review").

Note that the TRC's questions and comments are part of an iterative process, and that there are regularly several iterations before the Minister of Environment issues a Certificate of Determination for a project.

In accordance with Section 6(3) of the *EIA Regulation*, once the Minister has received sufficient information about the proposal including documentation of public and stakeholder concerns and the proponent's responses, the proponent will be notified of the Minister's decision within a maximum of 30 days. Typically, the total length of the review period is longer than 30 days because the proponent needs additional time to respond to the issues and concerns raised by the TRC following registration.

Open and transparent public involvement is required for all registered projects. In order to fulfill the requirements of Section 6(1) of the *EIA Regulation*, the proponent must demonstrate that the affected public and other stakeholders have been given the opportunity to become involved in reviewing the project, and must indicate how the proponent has considered or addressed any resultant questions and concerns. The opportunity for public involvement benefits citizens most when they take an active role at an early stage in the process, and clearly articulate their specific questions or concerns.

While final engineering details of a project are often not available at the time of project registration, full and accurate descriptions of the project, including its location, proposed activities, the existing environment, potential environmental effects and proposed mitigation are required as part of the EIA registration. A preliminary site plan showing the location of the various project components relative to each other and relative to the environmental features of the site must also be provided. The Project Assessment and Approvals Branch of NBENV can typically make a Determination Review (i.e. issue a Certificate of Determination or inform the proponent that a Comprehensive Review is required) within 90 to 120 days of the registration date for those registrations that are accompanied by complete and accurate documentation (as outlined in the registration guide and in the sector specific guidelines). This is also provided that the proponent responds promptly to the subsequent questions and concerns raised by the TRC.

If a Comprehensive Review is required, the following key process elements are undertaken:

- development of Draft Guidelines for the EIA;
- public input to Draft Guidelines;
- issuance of Final Guidelines for the EIA;
- development of Terms of Reference to meet the Final Guidelines;
- development of an EIA Report;
- public meeting(s); and
- decision by Lieutenant-Governor-in-Council.

The TRC would formulate Draft Guidelines for the Comprehensive Review. These guidelines identify the important environmental issues that must be considered in assessing the impacts of a particular development. They also specify the general approach a proponent must follow in conducting the comprehensive environmental impact assessment. The Minister must issue the Draft Guidelines for public comment within 60 days of announcing that a Comprehensive Review is required. Once the Draft Guidelines are available for public review, any interested party may provide written comments to the Minister in response to the document.

The Minister provides a period of 30 days for receipt of comments on the Draft Guidelines. Once this input has been considered, the Minister will issue Final Guidelines for the EIA to the proponent. This must be done within 60 days of releasing the Draft Guidelines for public comment. Following receipt of the Final Guidelines, the proponent must provide the Minister with a Terms of Reference document that describes in detail the approach that will be used by the proponent's study team during the preparation of the Comprehensive Review EIA. Although not required by regulation, NBENV expects a public and TRC review of the Terms of Reference before they are finalized.

The proponent is responsible for all costs associated with the EIA process.

The registration guide, the EIA Regulation and the NBENV Project Assessment and Approvals Branch should be consulted for further details on requirements. It is advisable to schedule a meeting with NBENV to discuss the specific requirements of a contemplated project prior to any detailed environmental assessment work to establish the registration requirements.

The majority of projects receive approval (usually with conditions) following the EIA registration and determination review process. From 1987 to 2004, approximately 1,000 projects were registered with the province, Comprehensive Reviews were completed on 16 projects and 170 projects were withdrawn or refused. Typically projects that will require a Comprehensive Review are those that use a new or relatively obscure technology or process or very complex (many potential environmental effects, interactions with many different environmental features) and capital intensive projects.

2.2.2.3 Sector Guidelines

Sector guidelines have been developed by NBENV to assist proponents in preparing a registration submission for specific projects. Where one exists for your type of project, the sector specific guidelines therefore need to be adhered to in conjunction with the General Information Requirements as outlined in the latest version of the Registration Guide (available online at

http://www.gnb.ca/0009/0377/0002/0002-e.asp). The following sector guidelines may apply to renewable energy projects: dams; impoundments and/or causeways; timber processing projects; waste disposal facilities; waste importation projects; wastewater treatment projects; waterworks and water supply projects and wind turbines. Some of the key requirements of these guidelines are outlined in Chapter 3.

2.2.3 Environmental Permitting Timelines

An example of the range of expected timelines for the EA/EIA approvals process is provided in Table 2.4. The information presented in Table 2.4 is for general guidance only and does not include expected timelines for a CEAA comprehenisive or panel review. The timelines for such studies are highly variable. The time required to complete the EA/EIA process is highly dependant on the submission of complete project documentation to the regulators as a first submission (EIA registration, CEAA project description) to minimize the number and scope of questions from the TRC/RA following their review.

Table 2.4 Typical EIA/EA Regulatory Timelines

Key Milestones	Responsible	Estimated Duration of Task (days)
Prepare Draft EIA Registration to initiate provincial EIA process	Proponent/Consultant	30-400 (425 days if full seasonal studies are required for biophysical components)
Prepare Draft Project Description to initiate *CEAA* process (if required)	Proponent/Consultant	30-180
Public Notification / Consultation on EIA Registration/Project Description	Proponent/Consultant	30 days after filing
Minister's Decision: Comprehensive Review required, project approved or project rejected under *Environmental Impact Assessment Regulation*	NBENV	90-120 days after filing
If Provincial Comprehensive Review Required (concurrent to Federal scoping if required)		
Public Release of Draft Guidelines	NBENV	30 days after decision
Initiate preparation of draft Terms of Reference based on requirements of Draft EIA Guidelines	Proponent/Consultant	30-60
30 day public comment period on Draft Guidelines	NBENV	30 days after release of draft guidelines
Final EIA Guidelines Released	NBENV	30 days after end of comment period
Finalize Terms of Reference to meet the Final EIA Guidelines	Proponent/Consultant	15-60
TRC Review of Draft Terms of Reference	TRC	30 days after filing
Respond to TRC questions and comments (disposition)	Proponent/Consultant	15-60
Public Consultation on Terms of Reference	Proponent/Consultant	60
Final Terms of Reference Issued	Proponent/Consultant	--
If CEAA Screening is required - Federal Scoping		
Federal Coordination initiated	RAs	Initiate on filing day of Project Description
Federal Coordination complete*	RAs	Approximately 180 days from filing Project Description
Scope Determination Released to Proponent and Public	RAs	-
If *CEAA* Comprehensive Study is required – Federal Scoping		
Federal Coordination initiated	RAs	Initiate on filing day of Project Description

Table 2.4 Typical EIA/EA Regulatory Timelines

Key Milestones	Responsible	Estimated Duration of Task (days)
Study Track Decision Complete	RAs	Approximately 180-270 days from filing Project Description
Conduct Comprehensive EIA (provincial)/Federal EA (concurrently)		
Conduct baseline studies to support EIA Report (*e.g.*, air quality modeling, rare plant surveys, wetland delineation, archaeological surveys *etc.*)	Proponent/Consultant	90-425
Conduct environmental effects assessment, Prepare Draft EIA Report to meet provincial and *CEAA* requirements	Proponent/Consultant	90-425
Submit Draft EIA Report for regulatory review	Proponent/Consultant	--
Initiate Translation of Draft EIA Report	translator	30-90 days minimum
Respond to TRC/RA questions and comments (disposition)	Proponent/Consultant	60 days from filing
Finalize EIA Report	Proponent/Consultant	30 days minimum
Finalize Translation of Final EIA Report	translator	30 days minimum
Public Release of Final EIA Report	Proponent/Consultant	30 days minimum after end of TRC / RA review
EIA/EA Decision Phase*		
Formal Public Meeting (Independent Panel)	NBENV / RAs	60 days after public release
EIA/EA Decision	NBENV / RAs	60 days after public meeting
Permitting Phase*		
Prepare Permit applications (*WAWA*, COA, HADD, *NWPA*, etc.)	Proponent/Consultant	Initiate after public release, 60 days duration
Obtain Permits	NBENV / RAs	30-150 days

Notes: * Permitting phase can be completed in parallel to EIA/EA Decision phase or following approval of the EIA registration

As illustrated by the range of timelines presented in Table 2.4, the schedule for the completion of EA/EIA process is variable depending on the nature, location and scope of the project, and can range from several months to several years. It is possible for a renewable project to receive environmental approval fairly quickly, especially if there are no federal triggers. As an example, the Kent Hills Wind Farm Project (Albert County, NB) was registered under the EIA Regulation and received approval approximately five (5) months following the submission of the registration.

A major limiting time factor for the completion of the EIA document is the requirement for field surveys. These are usually seasonal, and can be conducted by the proponent before initiation of the EA/EIA process to shift the timeline forward.

Note that following the EA/EIA decisions, the proponent must still comply with other regulatory requirements and obtain permits or other approvals, as appropriate. Applications for other necessary permits and authorizations can be completed and submitted while waiting for the final EA/EIA decision to streamline the process.

2.3 Environmental Reporting

Renewable energy projects are likely to have minimal pollutant releases with the exception of biomass projects which typically have associated air contaminant and waste water releases.

Federally, the National Pollutant Release Inventory (NPRI) is Canada's legislated, publicly-accessible inventory of pollutants released, disposed of and sent for recycling by facilities across the country. Industrial, institutional and commercial facilities which meet NPRI reporting requirements are required to report under the *Canadian Environmental Protection Act*, 1999, S 46(1) (CEPA 1999).

The NPRI is a Canadian database containing information on annual on-site releases of specific substances to the air, water and land, as well as disposals and off-site transfers for recycling that originate from industrial and institutional sources. The NPRI is managed by Environment Canada and currently tracks 367 substances and groups of substances. These substances are grouped into five different parts.

Failure to comply with any provision of the *CEPA*, including requirements for submission of the data or reports by the deadline stipulated in the notice is an offence under CEPA 1999.

Further details including the reporting thresholds and requirements for NPRI can be found at www.ec.gc.ca/pdb/npri/NPRI_home_e.cfm.

Renewable energy projects, such as biomass combustion based projects, may be subject to provincial Certificate of Approval requirements that may require separate emission or discharge monitoring and reporting requirements.

2.4 Water

The protection and preservation of water quality in surrounding oceans and marine environments, or in rivers, lakes, wetlands and other inland waterways, is an important focus in Canadian government acts and regulations. Both federal and provincial governments have made a number of rules governing what activities can and cannot be conducted in water environments. A summary of acts and regulations affecting water preservation and protection that may be applicable to a renewable energy project is provided in Table 2.5.

Table 2.5 Legislation Concerning Water Quality that may be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Application to Project	Activity or Component
Federal			
Canadian Environmental Protection Act	Environment Canada	Release of toxic substances S. 95; Water pollutants S.177, 181.	Hazardous material and POL storage, NPRI Reporting, Environmental Emergencies Regulations
Fisheries Act	Fisheries and Oceans Canada, Environment Canada	HADD authorization (S. 35(2)); Authorization for destruction of fish (S. 32); Authorization for deleterious substances (S. 36)	Construction of marine based infrastructure; Operation of cooling water intake structures; Release of wastewater
Navigable Waters Protection Act	Transport Canada	NWPA permit under S. 5(1)(a) and 6(4) to allow for an interference to navigation; Disposal of waste S. 21	Works or construction activity in navigable waters
Navigable Water Works Regulation	Transport Canada	Maintain access to work, and keep records of water flow and level S. 7	Construction and maintenance of dam or power plant in navigable water

Table 2.5 Legislation Concerning Water Quality that may be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Application to Project	Activity or Component
Natural and Man-made Harbour Navigation and Use Regulations	Transport Canada	Obstruction, interference, diversion or otherwise negatively affect a harbour S. 3	Construction, operation or decommissioning of facility
Canada National Marine Conservation Areas Act	Environment Canada	Use or occupancy of public lands S.12; Exploration and Exploitation for minerals, etc. S. 13; Disposal of substances S. 14; Pollution Clean-up S. 29.	Works or construction activity in conservation waters
Canada Water Act	Environment Canada	waste disposal in the water quality management area S. 9	Shipping, work, or construction activities in Canadian waters
Canada Shipping Act and Regulations	Transport Canada	–	Shipping activities during Construction and Operation
Canada Marine Act	Transport Canada	S. 56 – Clearance to Enter Waters of a Port; S. 27 may require authorizations for specified activities such as travelling through or docking at the Port of Saint John	Shipping activities during Construction and Operation; Anchorage, berthing, and deberthing activities.
Provincial			
Water Quality Regulation – Clean Environment Act	NB Department of Environment	S. 3(2) Discharge into waters of the Province; S. 3(3) Approval to Construct and Approval to Operate for the wastewater treatment system; S. 3(4) Sewage work and approval to discharge; S. 3(5) Approval for construction/operation of waterworks; S 3(6) Connecting to a municipal water system	Construction of facilities; Operation of wastewater treatment, cooling water, and sanitary wastes systems; Construction and Operation of water mains; Withdrawal of water during Construction and Operation.
Clean Water Act and Regulations (including *Watercourse and Wetland Alteration Regulation*)	NB Department of Environment	S. 12(1) Release of contaminant into or upon water; S. 15(1)(b) Permit for a Watercourse and Wetland Alteration	Construction/operation of facilities within 30 m of watercourse Process water releases into watercourses

The *CEPA* provides general guidelines that encompass restrictions on certain substances. For instance, those found on the Domestic Substances List cannot be manufactured in or imported into Canada (S.82). This list can be found on the Environment Canada website (http://www.ec.gc.ca). This list has over 22,000 substances. If a developer suspects that their project will require the use such a substance, they are encouraged to check the list. Further, if an organization or individual has released

or anticipates releasing toxic substances, they must notify the proper authorities at Environment Canada (S.95).

A number of acts and regulations govern the release of polluting substances into water and marine environments. The *CEPA* (S.176, 177, & 181), the *Canada Water Act* (S.9), the *Natural and Man-made Harbour Navigation and Use Regulations* (S.3(f)), the *Clean Environment Act, Water Quality Regulation* (S.3), the *Fisheries Act* (S.36(4)), and the *Clean Water Act* (S.12) all deal with the release of polluting substances in one form of waterway or another, showing that water quality protection is a key goal of government regulation. The *Canadian National Marine Conservation Areas Act* (S.12(b)) also notes that these areas cannot be occupied by people, unless a special permit is used (S.14). Further, it notes that if a polluting substance is emitted, it must be cleaned up (S.29). New Brunswick's *Clean Environment Act, Water Quality Regulation* (S.3), includes a number of rules about the disposal of sewage, which could apply to remote renewable developments and their waste disposal activities. Sewage is considered a contaminant, and as such, its discharge into waterways is restricted.

Some of these also make specific reference to the obstruction of waterways. The *Navigable Waters Protection Act* (S.21) notes that substances such as sawdust, edgings, slabs, bark or like rubbish, which might normally be considered non-polluting, are viewed as obstructing ships and other activities. *Natural and Man-made Harbour Navigation and Use Regulations* (S.3) also makes special note that these waterways cannot be obstructed, so as to maintain proper water flow, ensure safety, must not be a nuisance to users of harbours, or otherwise affect the water quality. The *Clean Environment Act, Water Quality Regulation* (S.3(3)) also places restrictions on the obstruction of a water source, unless approval is obtained to do so.

The construction, operation or maintenance of an activity, or a development within a waterway, is not permitted, according to the *Clean Environment Act, Water Quality Regulation* (S.3(8)), unless special approval is obtained. Similarly, though it may not apply to all renewable energy developments, the *Canada National Marine Conservation Areas Act* (S.13) restricts the exploration or exploitation of hydrocarbons, minerals, aggregates or any other inorganic matter within a marine conservation area.

Finally, there are a number of activities that are permitted within waterways, as noted in the *Clean Water Act, Watercourse and Wetland Alteration Regulation* (S.3). In an effort to help protect New Brunswick's surface water resource from the effects of activities such as: constructing poorly planned buildings, uncontrolled landscaping and forestry activities, and the installation of dams or other such water obstructions, the NBENV administers the *Watercourse and Wetland Alteration Regulation* permit program. Wetlands throughout the Province (including coastal marshes) are considered watercourses and any person working within 30 metres of a wetland is required to obtain a Watercourse and Wetland Alteration Permit. The program applies to all open channels, natural or artificial, which hold or carry water for any part of the year. Lakes, ponds, rivers, streams, brooks and wetlands are clearly watercourses; as are reservoirs, canals, ditches (NBENV 2008b).

It is important to inquire about the need for a Watercourse and Wetland Alteration Permit before construction activities within 30 metres of a watercourse or a wetland. Further details on these requirements can be found at www.gnb.ca/0009/0373/0001/0004-e.asp or by contacting the NBENV Watercourse and Wetland Alteration Program.

While a small project is likely to get prompt approval, more involved projects can take as long as two months, or more. Some larger projects require consultation with other departments such as the federal Department of Fisheries and Oceans, or the NB Department of Natural Resources (NBENV 2008b).

Finally, sources of drinking water are specifically protected as designated watersheds or well-fields. The *Watershed Protected Area Designation Order - Clean Water Act* would apply for work associated with the construction and operation of renewable electricity generating infrastructure located within any designated public surface drinking water supply.

The Wellfield Protected Area Designation Order - Clean Water Act would likely apply for work associated with the construction and operation of renewable electricity generating infrastructure located within any designated public groundwater drinking supply.

2.5 Air

The protection and preservation of air quality is another area of considerable attention in Canadian government acts and regulations. Both federal and provincial bodies have made a number of rules governing what activities can and cannot be conducted that affect air quality. A summary of the acts and regulations related to air quality that may be applicable to a renewable energy project is provided in Table 2.6.

Table 2.6 Summary of Legislation Concerning Air Quality that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Application to Project	Activity or Component
Federal			
Canadian Environmental Protection Act	Environment Canada	Release of toxic substances S. 95; Production, import, or selling of fuel with specific requirements S. 139 (1); Air pollutants S. 167, 171;	Hazardous material and POL storage, NPRI Reporting, Environmental Emergencies Regulations
Provincial			
Air Quality Regulation – Clean Air Act	NB Department of Environment	Section 3(1)(a) Approval to Construct and Approval to Operate a Source; S. 14 Approval to release smoke	Construction of air contaminant emissions sources (approval to construct); Operation of air contaminant emission sources (approval to operate).
Ozone Depleting Substances and Other Halocarbons Regulation – Clean Air Act	NB Department of Environment	S. 4 Release or use of ozone depleting substances; S. 14 Record keeping and reporting for ozone depleting substances; S.15 maintenance requirements for equipment containing ozone depleting substances	Construction and operation of refrigeration, air conditioning, and fire suppression systems

Two acts state policies in regards to the release of polluting substances or those that would be anticipated to be polluting into the atmosphere. The federal *CEPA* (S.171) and the provincial *Clean Air Act* (S.6(2)) both note restrictions on the release of damaging air pollutants. The *Clean Air Act* also has regulations for specific areas of air pollution. The *Air Quality Regulation* of the *Clean Air Act* makes special note that individuals may not direct or permit the construction, modification or operation of a source of air pollutants (S.3), unless special approval is obtained from the Minister of Environment.

New Brunswick air quality objectives have been established under the *Clean Air Act* for ground level concentrations of carbon monoxide, hydrogen sulphide, nitrogen dioxides, sulphur dioxide and total

suspended particulate. These objectives are listed in Schedule B and C of the *Air Quality Regulation*. Canada Wide Standards (CWS) have also been developed by the Canadian Council for Ministers of the Environment (CCME) under the Canada-wide Environmental Standards Sub-Agreement of the Canada-wide Accord on Environmental Harmonization. More information on current Canada Wide Standards can be found at the CCME website, www.ccme.ca/ourwork/environment.html. These standards do not carry the force of law unless specifically adopted by the province, but are typically referenced in EA/EIA.

The *Ozone Depleting Substances and Other Halocarbons Regulation* of the *Clean Air Act* disallows the use of any known substance that degrades stratospheric ozone from being used for any operations (S.4).

Combined, these acts and regulations ensure that air quality is not degraded and does not negatively affect human health, atmospheric integrity, and local ecosystems, and should not severely hamper renewable energy development and operations.

2.6 Land Use

The Province of New Brunswick has legislation governing the protection and preservation of land and natural areas. These acts clearly lay out the limits on what activities can and cannot be conducted on land and property within the province. A summary of the applicable acts and regulations affecting land preservation and protection is provided in Table 2.7.

Table 2.7 Legislation Concerning Land and Natural Areas that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Application to Project	Activity or Component
Provincial			
Crown Lands and Forests Act (including Leasing Regulation and Timber Regulation)	NB Department of Natural Resources	Lease agreement	Use of crown lands or forests
Topsoil Preservation Act	NB Department of Environment	Removal of topsoil S. 2, 3, & 4	Construction and operation of a development
Protected Natural Areas Act	NB Department of Natural Resources	S. 11 Prohibition of activities in Class 1 Protected Natural Areas S. 12 Prohibition of activities in Class 2 Protected Natural Areas	Construction or operation of a project

The *Protected Natural Areas Act* (S.11, 12) discusses which actions can and cannot be conducted on specific areas in the province of New Brunswick. In this act, there are two classes of protected natural area. No activities can be conducted in Class 1 areas (S.11), unless special approval is obtained. Class 2 areas allow certain activities, but still restrict activities related to agriculture, forestry, mining, blasting and drilling, construction, industrial, commercial and other activities which could be relevant to renewable energy development (S.12). If development is being conducted in an area adjacent to a Class 2 area, then certain activities are permitted, as long as they are necessary and incidental to development. The *Protected Natural Areas Act, Establishment of Protected Natural Areas Regulation*

produces a series of maps, which describe the location and boundaries of these protected areas. It is recommended that developers consult this act when considering the location of their project.

The *Topsoil Preservation Act* places restrictions on the removal and transportation of topsoil (S.2-4). A permit must be obtained in order to conduct these activities.

The *Crown Lands and Forests Act* governs how and when crown land can be used by individuals or companies in the province and provides the process for application for such use. The lease of crown land is regulated through the *Leasing Regulation*, under the *Crown Lands and Forests Act*. This regulation outlines the classes of lease for Crown lands available and the fees and rules associated with the lease of crown land. Included in those classes are non-fibre forestry leases which apply to the production of tree products other than processed wood. Economic rental is required for a non-fibre lease where economic rental means 10% of market value. Utility leases are provided for electrical utilities other than wind, at economic rental and wind farm leases of Crown land are specifically identified in Section 5.1.01. A formula is provided for the lease of crown property for wind farms which involves the number of hectares and installed capacity.

Crown timber rights are granted under the *Crown Lands and Forests Act* (S56.1). Timber is defined in the Act as *"all trees of any species or size whether standing, fallen, cut or extracted"*. Therefore, timber would include biomass for fuel use. Under section 28 of the *Crown Lands and Forests Act*, The Minister of Natural Resources, with the approval of the Lieutenant-Governor in Council, may issue a Crown timber license to a person who owns or operates a wood processing facility in the province or who undertakes by agreement with the Minister to construct and operate a wood processing facility in the province, and has entered into a forest management agreement with the Minister. Section 29 outlines the requirements of management and operating plans to be generated as part of the application for crown timber. The New Brunswick Department of Natural Resources manages the priorities to which Crown Land use may be put, and should be contacted for further details.

2.7 Flora and Fauna, Fisheries

The protection and preservation of ecosystem biodiversity is another significant portion of federal and provincial government acts and regulations. Ensuring that migratory birds, endangered or threatened species, and regional ecosystems are preserved is a key priority for governments. Both federal and provincial bodies have made a number of rules governing restrictions on certain development activities. A summary of the applicable acts and regulations affecting flora and fauna protection is provided in Table 2.8.

Table 2.8 Legislation Concerning Flora and Fauna that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Application to Project	Activity or Component
Federal			
Fisheries Act	Fisheries and Oceans Canada, Environment Canada	Authorization for destruction of fish (S. 32); fish-way construction (S. 20); channel obstruction (S.26); harmful alteration of fish habitat (S. 35); deleterious substances (S. 36); plans for major disturbance or development (S.37)	Construction or operation in marine or freshwater environment; construction of fish-ways; restrictions on water flow obstruction;

Table 2.8 Legislation Concerning Flora and Fauna that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Application to Project	Activity or Component
Migratory Birds Convention Act	Environment Canada	Possess or otherwise use a migratory bird nest S. 5; Use of substances harmful to migratory birds S. 5.1; destruction or harm of the individual, eggs or young	Construction particularly from disturbance during clearing and site preparation This Act covers all projects, construction, and operation
Species at Risk Act	Fisheries and Oceans Canada, Environment Canada	Kill, harm, possess, buy/sell an endangered species, or damage or destroy its residence S. 32, 33, 36	Construction of facilities, particularly from disturbance during clearing and site preparation
Provincial			
Endangered Species Act	NB Department of Natural Resources	S. 3 Kill, injure, disturb an endangered species, or destroy or disturb their shelter or habitat	Construction particularly from disturbance during clearing and site preparation

Endangered and threatened wildlife species that are protected federally under the *Species at Risk Act* (*SARA*) and are listed in Schedule 1 of *SARA*. As outlined in *SARA*, species can be classified as endangered or threatened by federal or provincial bodies (S.36). According to this act, no person shall kill, harm, capture, take, possess, collect or otherwise disturb any such species (S.32) or their habitat or place of residence (S.33).

SARA defines a "wildlife species" as a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and (a) is native to Canada; or (b) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.

The purposes of SARA are to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and to encourage the management of other species, to prevent them from becoming at risk. Critical habitat, as defined under *SARA*, is the habitat that is necessary for the continued survival of a SAR, or for the recovery of a SAR. Critical Habitat that has been identified for a given SAR and is part of an active recovery plan is listed on the Species at Risk Webpage (www.sararegistry.gc.ca).

Endangered plant and wildlife species are protected provincially under the *New Brunswick Endangered Species Act* (*NB ESA*). The purpose of this Act is to provide protection to endangered species and their habitats. The *NB ESA* prohibits disturbance of designated endangered flora and fauna species as listed in *Regulation 96-26* (*Endangered Species Regulation - Endangered Species Act*) and prohibits the killing, disturbing, or possessing of any member of a listed flora or fauna.

Migratory birds are protected federally under the *Migratory Birds Convention Act* (*MBCA*). The MBCA and regulations afford protection to all birds listed in the Canadian Wildlife Service Occasional Paper No. 1, "Birds Protected in Canada under the Migratory Birds Convention Act". The act and regulations state that no person may disturb, destroy, or take/have in their possession a migratory bird (alive or dead), or its nest or eggs, except under authority of a permit. The MBCA is administered by Environment Canada.

Fish habitat is protected under the federal *Fisheries Act* and by Fisheries and Oceans Canada's (DFO) Policy for the Management of Fish Habitat. This policy applies to all projects and activities in or near water that could "alter, disrupt or destroy fish habitat by chemical, physical, or biological means". The *Fisheries Act* also states that no person may kill fish by any means other than fishing, unless they obtain prior approval to do so from the Minister (S.32). Authorization under this act may be required if a project involves any in-water works, such as for: a fish-way construction (S.20); channel obstruction (S.26); deleterious substance use or discarding (S.36), or any other disturbance or development that may affect a waterway (S.37). A Harmful Alteration Disruption or Destruction of fish habitat (HADD) permit is required under the *Fisheries Act* for any activity that may result in the killing of fish (other than fishing) such as due to stream crossings for transmission lines or pipelines or construction in water (tidal, hydroelectric project).

2.8 Energy

The production, distribution, and use of energy and electricity are addressed in federal and provincial legislation. Both levels of government have enacted a number of rules governing restrictions on certain activities related to transmission, distribution, export/import and inspection of related infrastructure among other items. A summary of key applicable acts and regulations affecting energy and electricity is provided in Table 2.9.

Table 2.9 Legislation Concerning Energy and Electricity that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Approval, Permit, or Authorization Required	Activity or Component
Federal			
National Energy Board Act	National Energy Board	Export of electricity S. 119.02	Transmission of electricity for export purposes
National Energy Board Export and Import Reporting Regulations	National Energy Board	Export of energy, with information on amount, finances, and customer details S. 8	Exporting energy
National Energy Board Electricity Regulations	National Energy Board	International electricity exports and international power lines	Distribution of electricity internationally
Provincial			
Electricity from Renewable Resources Regulation - Electricity Act	NB Department of Energy	Approval of Qualified Renewable Generation Facilities. S. 4	Sales of renewable electricity to the standard service supplier to meet renewable targets
Electricity Act and Regulations	NB Department of Energy	S. 86 transmission ownership and operation, , providing or conveying electricity into, through or out of the transmission	Delivery of electricity from energy project

Table 2.9 Legislation Concerning Energy and Electricity that May be Applicable to a Project, and Possible Approvals, Permits or Authorizations Required

Legislation	Department/Agency	Approval, Permit, or Authorization Required	Activity or Component
Electrical Installation and Inspection Act and Regulations	NB Department of Public Safety	S. 4(1) requirement to meet electrical installation standards; Approval for electrical installation	Construction and Operation of a Project

Many of the acts and regulations that impact energy and electricity pertain to restrictions on the import and export of this resource and are, therefore, directed towards those operating a transmission system as opposed to a generator.

The *National Energy Board Act* requires a special permit for the export of electricity (S.119). Moreover, the *National Energy Board Export and Import Reporting Regulations* require exporters to submit monthly reports to the National Energy Board (NEB) that describe various aspects of the exported electricity, including the quantity, dollar value, and the end use customer (S.8(1)). The *National Energy Board Electricity Regulations* has further regulations that apply to international electricity exports and international power lines.

The *Electricity Act* of New Brunswick has a number of requirements and restrictions that apply to renewable energy developers. If an electricity producer is to inject electricity into the transmission system, they must be licensed to do so (S.86). Licensing is reviewed and issued by the New Brunswick Energy and Utilities Board (NBEUB). Industrial customers or municipal utilities may be exempt from these restrictions under certain instances, as described in the *General Regulations* of the *Electricity Act* (S.3.1).

The NBEUB is an independent quasi-judicial body created by the legislature to regulate the charges passed on to consumers by utilities. The NBEUB regulates the charges, rates and tolls for the NB Power Customer Service and Distribution Company as well as other specific aspects of the electricity market including the licensing of Market Participants.

The NBEUB has determined that a person who provides or conveys, or causes to be provided or conveyed, electricity or ancillary services into through or out of the transmission grid to any load facility directly connected to the transmission grid will require a license from the Board to be issued pursuant to Part V, Division A of the *Electricity Act*. The electricity licence application instructions, information on applicable fees, and the electricity licence application form are available on the NBEUB website:

http://www.nbeub.ca/index.php/en/electricity

The electricity licence application instructions outline various classes of licences for which application may be made, including transmission class, generation class, distribution class, marketer-aggregator class and New Brunswick System Operator class. The generation class would apply to projects that would generate and supply renewable electricity to the transmission grid.

Because the applicant may request authorization to conduct one of more of the activities described above, the activities must be indicated in the application as to the classes and subclasses of license which best describe the applicant's activity in the New Brunswick. The NBEUB will not process any

application until the required fee is received. The application instructions provide an overview of the requirements for each section of the application. If further assistance is needed, applicants are encouraged to contact the NBEUB by phone (506-658-5824) or at general@nbeub.ca. Prospective applicants are also encouraged to contact the NBEUB prior to filing an application to resolve any questions and to assure itself of the information requirement and processes.

Licence applications are reviewed by NBEUB staff, and are then forwarded to a Board Panel for approval. This is not usually a lengthy process but can be influenced by the NBEUB schedule.

The *Electricity from Renewable Resources Regulation*, filed in July, 2006 under the *Electricity Act*, outlines what the provincial Minister of Energy can approve as renewable energy. As noted in Section 4(1), a developer of renewable energy must satisfy that:

> "(*a*) the facility generates alternative-use electricity, biogas-fuelled electricity, biomass-fuelled electricity, solar-powered electricity, water-powered electricity or wind-powered electricity, as those terms are defined in the Certification Criteria Document; and
>
> (*b*) the facility is certified under the Environmental Choice Program established by Environment Canada as producing Type III Electricity, as that term is defined in the Certification Criteria Document." (Department of Energy, 2006)

If the generator of renewable energy does so on-site as either an embedded generation project or as a net metering project, they are exempt from Section 4(1)(b). Approval for such renewable generation must be reaffirmed each year via a submission to the Minister of Energy that notes the amount of energy generated and provided to the standard service provider for each month, and that the facility continues to generate energy as prescribed above (S.5).

Finally, in the construction, operation and maintenance of buildings and other structures (including those associated with renewable energy developments), the *Electrical Installation and Inspection Act* and its associated *General Regulations* sets out guidelines about the standards by which electrical installations must be made (S.3, 17). These installations are governed by standards developed by the Canadian Standards Association or other such recognized testing laboratory acceptable to the Chief Electrical Inspector of the Department of Public Safety.

The regulations outlined regarding transmission and export of electricity are not further discussed in other sections pertaining to specific renewable generation sources.

2.9 Employment

There are a few statutes and regulations that govern employment in the Province of New Brunswick. The *Employment Standards Act* sets guidelines on wages, hours of work, and other associated regulations, which must be complied with to employ workers in the province.

The other main act governing employment is the *Occupational Health and Safety Act*. It states that every employer with twenty or more employees shall establish and file a safety policy in respect of that place of employment (S.8). Further, pursuant to Section 9, employers must ensure that the workplace is kept safe from hazards, that all equipment and tools reach minimum health and safety standards, and that all employees are properly trained regarding health and safety procedures and provided with appropriate safety equipment. The *Workplace Hazardous Materials Information System Regulation* of the *Occupational Health and Safety Act* requires that an employer shall ensure that a controlled product

is not used, stored or handled at a place of employment unless the requirements of this Regulation are complied with (S.4).

Employment legislation is not further discussed or presented as it may relate to specific projects.

2.10 Greenhouse Gas Management Programs

The rationale for increased renewable energy supply is primarily improved security, price stability, diversity of supply, system reliability and economic development in the province. Additional motivation particularly for more renewable energy production has also originated as part of the province's response to climate change, including voluntary and proposed regulatory greenhouse gas (GHG) emission management programs. Because of the low GHG emissions associated with renewable energy compared to fossil fuel-based generation, electricity generated from these sources can off-set generation from higher GHG intensity sources. These "off-sets" carry monetary value under several different programs. The following sections provide an overview of GHG emissions in Canada and New Brunswick as well as a summary of currently available information on the federal GHG program and select other programs. The most up-to-date information on the federal plan to reduce GHG emissions can be found on the Environment Canada website at: www.ec.gc.ca/default.asp?lang=En&n=75038EBC-1a.

2.10.1 BACKGROUND

Greenhouse gas emissions are tracked by the federal and provincial governments. Specifically, GHG emission reports are required under *CEPA* to be filed by the owners of the most substantive sources. Because they are of monetary value, more detailed protocols are continuously being developed, and in regulated jurisdictions such as Alberta, these emission reports must be verified by a third party. The following is the current situation in Canada and New Brunswick.

National

National GHG emissions in Canada are reported in the National Inventory Study, published annually by Environment Canada (Environment Canada 2008a). The latest report includes 2006 data and a summary of national GHG sources categorized by sector. Between 1990 and 2006, GHG emissions from electricity generation rose by over 22 percent, even given the decrease of 13 percent that occurred from 2003 to 2006.

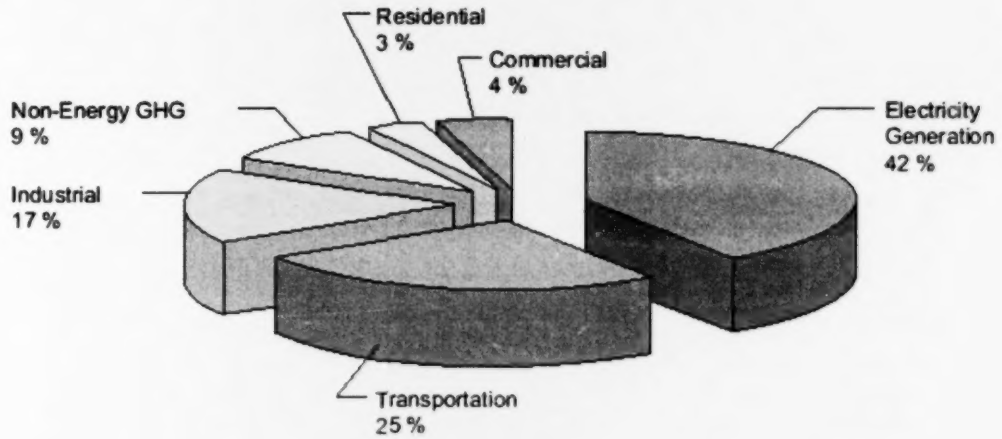
By May 30, 2008, most large GHG emitters were required to file more detailed emission inventories for the proposed federal base year of 2006. These reports included other related information with respect to the source including emission control, monitoring and management equipment, and production information as required by Environment Canada under Section 71 of *CEPA*.

Federal government regulations on GHG emissions are emerging and may soon come into force. In *Turning the Corner,* the policy documents released by the federal government in April 2007 and March 2008, it is proposed that substantive GHG emission reductions will be required of the electricity system by 2020. It is anticipated that these regulations will provide substantive addition impetus for additional renewable electricity generation.

New Brunswick

The New Brunswick Climate Change Action Plan 2007-2012 (NBENV 2006) identifies six sectors contributing to GHG emissions in New Brunswick as depicted in Figure 5.

Figure 5 Provincial GHG Sources by Sector (2004)



The New Brunswick Climate Change Action Plan 2007 - 2012 has identified GHG reduction and avoidance initiatives. This plan was published prior to the most recent guidance on federal regulatory intentions or their effect on New Brunswick GHG emission sources, and does not speculate on the addition of new sources. The Province has set a target to reduce GHG emissions to 1990 levels by 2012, and to reduce GHG emissions 10% below 1990 levels by 2020. The measures aim to address GHG emissions through the energy sector in the following ways:

- commitment requiring that 10% of electricity sales must come from new renewable sources by 2016, *Electricity from Renewable Resources Regulation*;
- $15.3 million in funding to the NB Energy Efficiency and Conservation Agency for home energy conservation initiatives;
- refurbishment of the Point Lepreau Nuclear Station, resulting in generating capacity increase and approximately 0.6 megatonnes per year of CO_2 emission reduction by 2010; and
- addition of wind energy to the grid in 2008.

NB Power has entered into long term Power Purchase Agreements with four wind turbine farm project owners to purchase all of their energy output plus any environmental attributes that they may produce such as renewable energy credits or carbon offset credits (NBSO 2008b).

2.10.2 Turning the Corner

The April 2007 Regulatory Framework for Air Emissions describes the proposed federal regulations for industrial emissions of both GHG and air pollutants (Environment Canada 2007b). This was followed in

March 2008 by an updated framework called *Turning the Corner: A Regulatory Framework for Industrial Greenhouse Gas Emissions* (Environment Canada 2008b).

Environment Canada (2008b) states an intention to work to reach equivalency agreements with interested provinces that set enforceable provincial GHG emission standards that are at least as stringent as the proposed federal standards. This regulatory framework aims to reduce Canada's total GHG emissions by 20% below 2006 levels by 2020. The proposed regulations will require fossil fuelled generating facilities to make an initial 18% intensity reduction by 2010 using 2006 as a base year, and an additional 2% intensity reduction per year for next 10 years to 2020. New Brunswick has yet to express an intention to set standards provincially.

The federal framework is being translated into regulatory language, and draft regulations were expected to be published for public comment in the fall of 2008. Regulations are expected to be approved, published in the fall of 2009, and to come into force on January 1, 2010.

2.10.2.1 Compliance Mechanisms

The proposed federal GHG emissions regulatory system includes a number of mechanisms and options whereby industrial emitters can meet their emission reduction obligations. These options include reducing their GHG emissions intensity by technology or management improvements or the purchase of carbon offset credits through a domestic offset system or, in limited numbers, from domestic credits for early action or the Kyoto Protocol's Clean Development Mechanism (CDM). Renewable energy projects would be intended to interact in the federal framework by generating the required off-set credits needed by industrial emitters. However, to do so, clear ownership of the offset credits must be retained. Projects that receive public incentives or that are required as a result of regulations, such as renewable portfolio standards regulations, may not generate credits for the project Proponent. However, these issues will not be resolved until the regulations are finalized. Below is a discussion of the offset program as proposed in March 2008, and how it might apply to renewable energy producers.

2.10.2.2 Greenhouse Gas Offset Systems

A carbon offset is created when a reduction or removal of a GHG emission takes place because of a specific project undertaken with this expressed purpose. The avoided GHG emissions could be turned into a credit available for trade on a voluntary or regulated GHG market. In most cases, this credit is equivalent to the avoided GHG emissions as a result of the project (emissions that would have otherwise been generated from traditional/fossil fuel based electricity production).

The system proposed (Environment Canada 2008b) will issue offset credits for incremental real, verified domestic reductions or removals of GHG emissions generated by projects undertaken by non-regulated industrial entities. Regulated industrial facilities can purchase offset credits to enable them to be in compliance with their regulated emission reduction target. It is anticipated that the system will be comprised of offset options from multiple sectors.

Regulated entities may undertake projects to create internal offset credits that will assist them with their compliance requirements, or for trading to other regulated facilities should they generate excess credits. In order to qualify as an offset:

- The project must take place in Canada.

- The project must achieve emission reductions of one or more of the following GHG: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, or sulphur hexafluoride.

Carbon markets, trading in these offset credits, offer an opportunity to reduce compliance costs for regulated GHG emitters. This market would potentially create other streams of revenue for renewable energy developers as the emission regulated electricity markets account for the cost of GHG emissions and reductions.

2.10.2.3 Renewable Energy Credits

Renewable Energy Credits (REC) are a well established environmental market in the United States, with sales of 12 billion kilowatts in 2006 (NREL 2007). RECs quantify the benefits from generating renewable electricity by calculating the reduction of air pollutant and GHG emissions, and other benefits, as one commodity. RECs are tradable environmental commodities that represent that one (1) megawatt-hour (MWh) of electricity was generated from an eligible renewable energy resource such as wind, solar, geothermal and biomass projects.

Renewable Portfolio Standards (RPS) can have an effect on the pricing of REC because each jurisdiction has a unique mix of energy resources and sets its own requirements in terms of renewable sources and timeframes for compliance. Currently over 27 states in the US, and the majority of provinces in Canada have a form of RPS. On the high end, pricing for solar REC in New Jersey have an average price of $200, with an established ceiling of US $300. Retail programs throughout the United States have a low-end of $10 per MWh, and a median of US $17.80 (NREL 2007).

While there are currently no national program to monitor non-encumbered (regulatory surplus) REC, there are several regional registries that track renewable energy generation in participating states and provinces. For example, the Midwest Renewable Energy Tracking System (M-RETS) tracks renewable energy generation in Illinois, Iowa, Manitoba, Minnesota, Montana, North Dakota, South Dakota, and Wisconsin. There are similar systems in New England, the Mid-Atlantic, Western States, and Texas, most of which are administered by APX Inc (www.apx.com). There are ongoing efforts to harmonize these registries in order to develop a national and North American registry.

In addition, there are a variety of voluntary programs that verify and certify REC to track and avoid double counting. The most prominent is the Green-e program, managed by the Center for Resource Solutions. In 2006, 8.8 million MWh of Green-e certified REC were sold, double that of 2005. More information on the Green-e program can be found at www.green-e.org/getcert.shtml.

There are several options for renewable energy generators to sell REC. The first option is to review whether a given facility is eligible to sell into a regional RPS. These requirements are typically outlined in the legislation or program requirements of the RPS. Failing RPS eligibility, renewable energy producers in Canada can sell on the voluntary market. While not a requirement, ensuring the renewable energy is Green-e eligible provides greater buyer confidence. Green-e recognizes EcoLogo certification as a pre-requisite for Canadian renewable energy to be Green-e certified. EcoLogo is an environmental marketing program managed by TerraChoice Environmental Marketing on behalf of the Canadian government since 1996 (www.ecologo.org). If a renewable energy project achieves EcoLogo certification, it has passed the basic requirements to meet Green-e certification.

Both EcoLogo and Green-e certification can be attained either upstream or downstream in the sales process. For example, a renewable energy producer could sell Green-e certifiable environmental

benefits to a wholesaler or broker, who in turn would sell to a retailer. At any of those three stages, the owner of the renewable energy environmental benefits can go through the process of certifying those environmental benefits to EcoLogo or Green-e standards.

In New Brunswick, NB Power typically negotiates ownership of any environmental attributes that may be produced (such as renewable energy or GHG offset credits) as part of their power purchase agreements (NBSO 2008b).

2.11 Local Government

An overview of the local government structure in New Brunswick is provided to give context to the planning mechanisms in place. In the event that a project is being proposed in a given community, the local government should be consulted early in the process to determine specific requirements.

Land use planning in New Brunswick is regulated under the *Community Planning Act* and the *Municipalities Act* which are administered by the NBDENV and the NBDLG respectively. The *Municipalities Act* provides the legislative framework for municipal powers and responsibilities. It outlines administrative, financial, and operational responsibilities governing municipalities and rural communities. The *Community Planning Act* establishes the overall planning framework in the province, identifying planning jurisdictions, planning responsibilities and powers, and processes for adoption of planning policy, by-laws and regulations.

Note that a report *"Building Stronger Local Governments and Regions"* was released in late 2008. It can be found at http://www.gnb.ca/cnb/Promos/FLG/index-e.asp. The initial reaction has been that changes will not be introduced in the near term.

In terms of planning, New Brunswick land falls generally into two categories of governance being unincorporated or incorporated areas. Unincorporated areas are the responsibility of the NBENV and are defined as those areas of the Province not located within the boundaries of a city, town, village or rural community. An incorporated area is the land located within the boundaries of a city, town, village or rural community.

Of the 102 municipalities in NB, there are 8 cities, 26 towns and 68 villages, with 63% of NB's total population (Local Government Resource Manual 2007). Approximately 37% of New Brunswick residents live in unincorporated areas divided into 269 Local Service Districts (LSD). The Province is divided into 12 Planning Districts, containing municipalities, rural communities and LSD's, that are governed by District Planning Commissions. District Planning Commissions are empowered to administer planning regulations that have been established by municipalities, rural communities, and by the province on behalf of unincorporated areas.

Discussions should be held among the developer, the local government representative, and the District Planning Commission early in the planning of a project to identify any conflicts with existing zoning, by-laws or rural/municipal plans.

2.12 Land Acquisition

In New Brunswick, all land not privately-owned is known as Crown or public land. There is 5.4 million hectares of Crown land in New Brunswick, a total of 3.3 million hectares upland (mainly forest) with the remaining 2.1 million hectares under water. The NBDNR is responsible for Crown land and has a

number of policies to deal with acquiring or leasing Crown land. Further information can be found at www.gnb.ca/0263/index-e.asp.

Information on private and crown land can also be attained from Service New Brunswick (SNB). Service New Brunswick provides over 200 services to the public through a network of office locations, on-line services, and Service New Brunswick TeleServices (Call Centre). These services include:

- the operation of New Brunswick's Land Registry, Personal Property Registry, Corporate Affairs Registry;
- assessment of all land, buildings and improvements for property taxation purposes;
- the operation of the province's Property Assessment and Taxation System; and
- maintenance of New Brunswick's land information infrastructure.

Information on Crown and private land as well as property assessment and Land Registry and Mapping Services can be found at www.snb.ca. These services can provide developers with a variety of information including maps, topographic data, ownership of land and assessment value of land.

Any renewable energy project involving Crown land would have to satisfy the requirements contained in the NBDNR's policy entitled *Departmental Consultation with First Nation Communities*.

2.13 Other

Other codes that could apply to renewable energy projects include areas such as building codes, transportation of dangerous goods and the use of explosives.

All buildings and related structures constructed as part of a renewable energy project must comply with the *Fire Safety Act*, the *National Building Code*, and other building construction regulations, where appropriate. All buildings and lots must comply with the *Provincial Building Regulation - Community Planning Act*. These acts and regulations will be enforced by provincial inspectors.

Certain projects may need to comply with the *Transportation of Dangerous Goods Act*. This statute states that no person may transport or import dangerous goods unless their activities comply with all applicable safety requirements, with the appropriate documentation, and containment and transport comply with the prescribed safety standards and are labelled with the appropriate labels (S.5). Similarly, if explosives are being used in a project, for construction purposes or otherwise, a permit is required for their transportation, and for the importation of explosives (*Explosives Act* (S.7, 9)).

The Department of Transportation (NBDOT) administers legislation pertaining to transportation in the province. Section 261 (1) of the *Motor Vehicle Act* requires that any vehicle, with or without load, or any combination of vehicles with or without load, not conforming to the weights and dimensions set out in *Regulation 2001-67 - Vehicle Dimensions and Mass* must make application for, and obtain, a special permit in order to be authorized to operate such vehicles on New Brunswick highways. A special permit may be required for the transportation of large or heavy project components to the project site (such as wind turbine components).

3.0 SPECIFIC ISSUES WITH RENEWABLE ENERGY SOURCES

The following sections introduce and outline key legislation for the primary renewable energy resources introduced above. The background information presented in Chapter 2 should be reviewed in combination with the renewable generation specific sections presented in this chapter for a more complete understanding. The information is presented to provide an overview of legislation and depending on the scope of the project, there may be additional regulatory requirements.

General information on renewable energy in New Brunswick can be found on several websites, including NB Power and Department of Energy. For further information on renewable energy from a variety of sources, see the list of websites at the end of this document.

3.1 Wind

The Province is committed to increasing its generation capacity from renewable resources to meet its regulatory requirements requiring that NB Power D&CS purchase 10 per cent of electricity sales from renewable sources by 2016. The major wind developments currently with power purchase agreements from NB Power are shown in Figure 6. There are other wind projects in the queue for system impact studies: www.nbso.ca/Public/en/op/transmission/connecting/application.aspx.

Figure 6 Geographic Locations of Announced New Brunswick Wind Developments

www.nbpower.com

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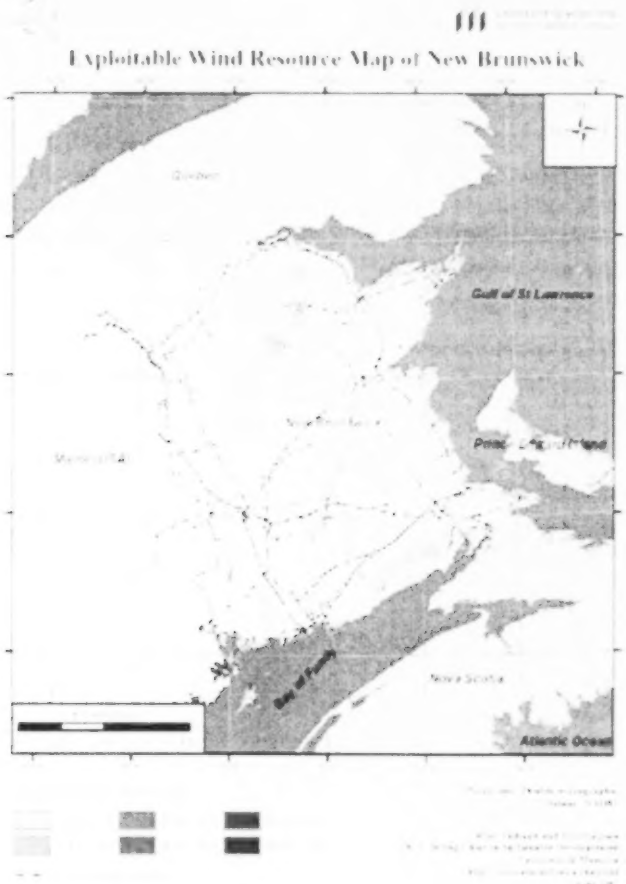
Figure 6 Geographic Locations of Announced New Brunswick Wind Developments

NB Power has stated a preference to geographical diversity in the wind projects to take advantage of temporal and geographic variation in wind energy availability to the system.

Researchers, lead by Dr. Yves Gagnon, the K.C. Irving Chair in Sustainable Development at the Université de Moncton, and a WEICan Board director, developed an updated, high-resolution wind map of New Brunswick in May of 2007. The potential of the wind resource around the province illustrated in this map can be used by NB Power and individual developers in planning their project proposals. The *Exploitable Wind Resource Map of New Brunswick* is reproduced below in Figure 7.

Figure 7 Wind Resource Map of New Brunswick



Source: http://www.umoncton.ca/chaireedd/atlas_eoliens.html

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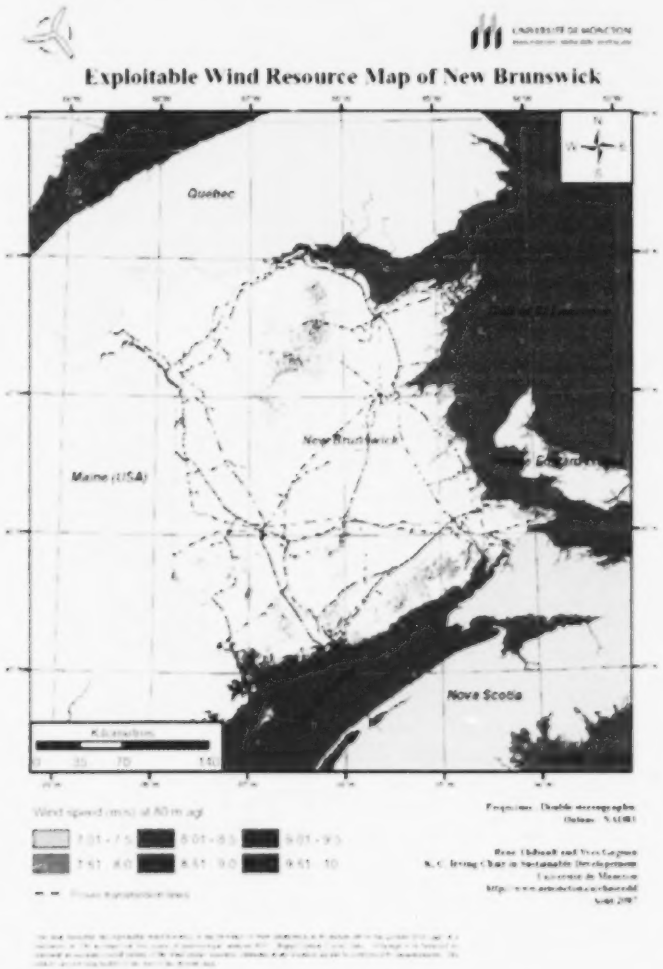


Source: http://www.umoncton.ca/chairedd/atlas_eoliens.html

As illustrated, wind energy development potential exists in many regions of the Province, along the coasts as well as inland in areas of elevated terrain. In total, roughly 5,200 square km of land has wind resources of 7 m/s or greater, the threshold for an economically viable wind source. This wind resource has a theoretical potential of over 41,500 MW of electricity.

Details on the regulations and policies that could apply to wind energy developments are provided in the following sections.

3.1.1 Environmental Assessment Process

An overview of the EA requirements for wind energy projects is provided in the following sections. Section 2.2 should be reviewed for basic background information on EA. The NBENV and CEA Agency should be consulted regarding EA requirements for specific projects.

3.1.1.1 Federal

A federal EA for wind energy projects may be required if the project is located on federal land or receives federal funding, or requires a permit on the *Law List Regulations*. The EA would likely be a screening-level EA based on recent projects. "Environmental Impact Statement Guidelines for Screenings of Inland Wind Farms under *CEAA*" (NRCan 2003) outlines the requirements of *CEAA* screenings completed with NRCan as the Responsible Authority (RA).

The involvement of other departments depends on the triggers for the review. However, the following federal departments or agencies may be involved as RA or may be called upon to provide expert advice during the EA process:

- Natural Resources Canada;
- Canadian Broadcasting Corporation/Radio-Canada;
- Department of National Defence;
- Fisheries and Oceans;
- Environment Canada;
- Transport Canada; and
- Health Canada.

3.1.1.2 Provincial

A wind energy project would trigger the provincial Environmental Impact Assessment (EIA) process if the project involves one of the activities listed in Schedule A of the EIA Regulation (refer to Section 2.2.2). In the event that an EIA registration is required, sector specific guidance is available from the NBENV for wind turbine projects at www.gnb.ca/0009/0377/0002/0004-e.asp and should be reviewed in detail during the planning stages of a wind turbine project. The NBENV is also developing *Guidelines for Siting Wind Turbines in New Brunswick* that will specify minimum setback distances (NBENV 2008c).

Wind turbine siting criteria should include a consideration of factors such as the use of the site and surrounding areas by birds and bats, the importance of the site for species at risk, and visibility

climatology (birds). Pre-construction surveys may be required to establish an adequate understanding of bird and bat use of a proposed site (feeding, migration, breeding, nesting, wintering). Pre-submission consultation is strongly encouraged to avoid delays.

The information included in the EIA registration regarding physical components of the project must include at least the following:

- detailed mapping of the site including the locations of individual turbines;
- summary tables listing total length of new roads, improved roads, power lines, total hectares of forest to be cleared (by forest type), total number of road crossings of streams and other site changes;
- how water requirements for construction activities (pressure washing of components, concrete manufacture, dust control) will be met;
- whether power lines will be trenched or overhead;
- description of the connecting power line;
- turbine blade speed in revolutions per minute;
- tower dimensions and design (e.g., height, rotor diameter, guy wires, noise production) for the wind turbines and meteorological towers; and
- types of lights to meet turbine lighting requirements.

As described in the NBENV EIA Registration Guide, all anticipated environmental effects of the project must be discussed. These will depend on the scope and complexity of the project as well as the project location. A summary of the environmental effects that must be addressed for a typical wind project include at least the following:

- site-specific analysis of anticipated bird and bat mortality due to the project;
- site-specific analysis of the anticipated disturbance to bird life cycle (flight paths, wintering, breeding, resting, feeding);
- the anticipated impact on marine habitats due to transmission of noise and vibration into the marine environment (for off-shore or near-shore installations only);
- a noise impact study for all noise sensitive locations (including recreational, residential and institutional uses) within 1 kilometre of the nearest turbine;
- a visual impact analysis including but not limited to:
    - a) preparation of "worst-case" computer generated zone of influence mapping that indicates all locations from which the proposed turbines will be visible given existing topography (ignoring intervening vegetation or buildings); and
    - b) computer generated photomontage visual simulations of the facility as viewed from selected sensitive locations within the zone of visual influence (e.g. publicly accessible areas, highways, recreation spaces, residential areas).

- a moving shadow assessment comprised of a worst case computer generated analysis of "moving shadow" (flicker) impacts of turbine blades as experienced on occupied adjacent lands and public roadways, when the sun is low on the horizon (ignoring intervening vegetation or buildings).
- location of the site with respect to TV, microwave and cell phone transmission facilities and assess the potential for moving turbine blades to block or deflect such signals(*Technical information on the Assessment of the Potential Impact of Wind Turbines on Radio Communication, Radar and Seismoacoustsic Systems* (CANWEA, April 2007));
- an assessment of the potential impacts on human health from exposure to electric and magnetic fields generated by project components; and
- an assessment of the potential for possible injury to the public due to ice thrown from rotating blades, a damaged blade thrown from turbine, a design failure under extreme weather conditions and increased fire hazard due to the presence of electrical generating equipment.

3.1.2 Federal Legislation

Other federal legislation or policies which may also apply to certain wind energy projects are listed in Table 3.1.

Table 3.1 Potentially Applicable Federal Legislation – Wind Energy

Legislation / Policy	Department/Agency	Application to Project	Trigger Activity or Component
Fisheries Act	Fisheries and Oceans Canada	subsection 35(2) authorization	Potential environmental effect on fish habitat
Navigable Waters Protection Act	Transport Canada	NWPA permit under S.5(1)(a) to allow for an interference to navigation Disposal of waste S.21	Potential environmental effect on navigable waters
Explosives Act	Natural Resources Canada	S.7(b) and S. 9 require a permit for transportation and importation of explosives	Blasting during site preparation
Species at Risk Act	Fisheries and Oceans Canada, Environment Canada	Kill, harm, possess, buy/sell an endangered species or damage or destroy its residence S.32, 33, 36	Possible environmental effect on species at risk
Migratory Birds Convention Act	Environment Canada	Possess or otherwise use a migratory bird nest S. 5 Use of substances harmful to migratory birds S.5.1	Possible effect on migratory birds
Aeronautical Safety	Transport Canada	Obstruction Clearance Form	Any structure taller than 30 m
Aeronautical Safety	Nav Canada	Land Use Submission Form	Any structure taller than 30.5 m or within a 10km radius of an airport
Seismoacoustic Monitoring Equipment	Natural Resources Canada	Consult Natural Resources Canada	Possible effect on monitoring array (considered for radius of at least 10–50 km)
Air Defence Radar	Department of National Defence (DND)	Consult DND	Possible effect on radar (considered for radius of at least 100km)
Air Traffic Control Search Radar	DND and Nav Canada	Consult DND, Nav Canada	Possible effect on radar (considered for radius of at least 60km)

Table 3.1 Potentially Applicable Federal Legislation – Wind Energy

Legislation / Policy	Department/Agency	Application to Project	Trigger Activity or Component
Telecommunications	Canada Broadcasting Corporation/Radio-Canada	federal representative for telecommunications, including radio communications	Potential telecommunications interference
Canadian Coast Guard Vessel Traffic Radar System	Canadian Coast Guard	Consult Canadian Coast Guard	Possible effect on radar (considered for radius of at least 60km)
Military Airfield	DND	Consult DND	Considered for a radius of at least 10km
Weather Radars	Environment Canada	Consult Environment Canada	Possible effect on radar (considered for radius of at least 80km)
Radio Communication	Industry Canada, DND and RCMP	Consult DND	Possible effect on radio (considered for radius of at least 1km)

Transport Canada is the public agency responsible for aeronautical safety and requires notification of wind turbine construction under certain criteria to ensure that they are noted on aeronautical maps and flight plans and that they are appropriately marked and lit for visual identification by aircraft. Transport Canada, therefore, must be informed of any wind turbine higher than 30 m. through completion of their Obstruction Clearance Form. NAV Canada also requires notification, by completion of their Land Use Submission Form, of any wind turbines that are to be constructed within 10 km radius of an airport (regardless of height), and of any wind turbine outside of the 10 km radius that is taller than 30.5 m.

3.1.3 Provincial Legislation

Other provincial legislation or local codes which may also apply to certain wind energy projects are listed in Table 3.2.

Table 3.2 Potentially Applicable Provincial Legislation – Wind Energy

Legislation / Codes	Department/Agency	Application to Project	Trigger Activity or Component
Crown Lands and Forests Act, Allocation of Crown Lands for Wind Power Projects Policy	Department of Natural Resources	Lease agreement	Requests for wind energy projects on Crown land
Clean Water Act, Watercourse and Wetland Alteration Regulation	Department of Environment	S.15(1)(b) Permit for a Watercourse and Wetland Alteration	Facilities constructed within 30 m of a wetland or watercourse
Electrical Installation and Inspection Act	Department of Public Safety	S.4(1) requirement to meet installation standards	All electrical systems and equipment with exceptions of electrical and communication utility systems, equipment and wiring on aircraft, ships, trains and automotive equipment, motor rewinding and repairing of radios and other electronic equipment

Table 3.2 Potentially Applicable Provincial Legislation – Wind Energy

Legislation / Codes	Department/Agency	Application to Project	Trigger Activity or Component
Endangered Species Act	Department of Natural Resources	S. 3 Kill, injure disturb an endangered species or shelter or habitat	Possible environmental effect on an endangered species
Motor Vehicle Act, Vehicle Dimensions and Mass Regulation - Motor Vehicle Act	NB Department of Transportation	Special Permits for moving large structures	Transporting large structures or masses on NB highways
Highway Act, Highway Usage Regulation	NB Department of Transportation	Application for public property easements	Installation of utility lines along public highways
Community Planning Act	Department of Environment		Various Land Use Regulations
National Building Code; National Fire Code; National Plumbing Code; National Energy Code for Buildings.	National Research Council, Natural Resources Canada	Building, fire, plumbing, and electrical permits	Construction and Operation of the Project

A "wind power on Crown lands" risk assessment was conducted in early 2005 by the NBDNR, with one of the highest risk areas identified being the nonexistence of a policy to deal with wind power on Crown lands. This led to the development of a draft interim policy (DNR 2007). The objective of this policy is to provide a consistent approach in the allocation of Crown lands to wind power exploration and development. In the wind power policy, it states that the development of any wind farm is a mandatory two-stage process-with licensing in advance of any subsequent lease:

- Wind power companies must obtain a License of Occupation for Wind Exploration with or without an Option Agreement (providing the company with the first right to apply for a Wind Farm Lease exclusive of any other wind power company). The license may authorize the installation of meteorological test towers, geotechnical studies and centre-line clearances. Licenses may be amended prior to and during an EIA, or after a wind farm project is approved under the EIA Regulation. During an EIA, DNR would not amend a license unless NBENV had reviewed the work to ensure it did not conflict with the EIA guidelines.
- After a wind farm project is approved by NBENV (a Certificate of Determination is issued), NBDNR may consider issuing a Wind Farm Lease together with a License of Occupation for Access and Distribution to authorize the construction and operation of the wind farm.
- A License of Occupation for Construction may also be issued if additional Crown lands are needed for construction that are outside of the footprint of the Crown lands to be included in the Wind Farm Lease and associated license.

The wind power policy also prescribes minimum setback distances for a variety of land uses. The setback distances from the Crown lands document are reproduced in Table 3.3.

Table 3.3 Setbacks for Wind Turbines on Crown Lands (NBDNR 2005)

Land Use/Cover	Setbacks
Crown lands boundaries, lakes, watercourses, wetlands and coastal features (as defined by the Coastal Areas Protection Policy)	150 m, or 1.5 x height of turbine, whichever is greatest
Public highways, roads and streets (including roads and streets within the boundaries of a city, town or village), designated as highways under the Highways Act; and areas designated for those purposes in a plan adopted under the *Community Planning Act*	500 m, or 5 x height of turbine, whichever is greatest
Existing recreational, institutional and residential areas, and areas designated for those purposes in a plan adopted under the *Community Planning Act*	500 m, or 5 x height of turbine, whichever is Greatest
Other built-up areas, e.g. industrial areas	150 m, or 1.5 x height of turbine, whichever is greatest
Communication, fire, airport and other tower structures, Archaeological & Historical Sites (listed by the Culture & Sport Secretariat), wind power option agreement areas, wind test towers and wind farms, either existing or under application review; unless occupied by, or part of applicant's proposal	500 m, or 5 x height of turbine, whichever is greatest
Endangered species habitat (*Endangered Species Act*); important migratory bird nesting sites and migration routes (*Migratory Birds Convention Act*); important water-bird breeding colonies; national wildlife refuges; wildlife management areas (*Fish & Wildlife Act*)	1000 m

*From the centre of a wind test tower or turbine

It should also be noted that under the *Interim Policy for the Allocation of Crown Lands for Research in Support of In-Stream Tidal Power Generation*, off-shore wind energy projects are not currently permitted (NBDNR 2007). Paragraph 24(1)(a) of the *Crown Lands and Forests Act* is important to note if a lease of greater than 20 years is desired. The Minister may issue a Wind Farm Lease for a term of 20 years; however, any lease with a term greater than 20 years up to a maximum of 30 years will require an Order in Council. This is normally a 6 – 8 week process, which can only be started after EIA approval. Until then, no construction is authorized.

A single entry point to government for all wind power projects on all provincial Crown lands has been established. The Departments of Agriculture and Aquaculture, Natural Resources, Supply and Services, Transportation and Business New Brunswick agreed that the DNR policy would govern wind power projects on all Crown lands. The NBDNR's Crown Lands Branch - Land Use Application Service Centre is the single entry point. Applications for all crown land uses and transaction types including those mentioned above, are available on-line at www.gnb.ca/0263 (toll-free number 1-888-312-5600).

If the application is for Crown land located in an area where a municipal plan, rural plan, basic planning statement or zoning by-laws or regulations are in effect, the proponent will have to show conformity to them or apply for an amendment. For any application that requires an amendment, NBDNR may undertake the evaluation of the application but will not make a final offer to the applicant until the amending by-law or regulation has been enacted. Where the application to amend a plan and/or zoning by-law or regulation is rejected, NBDNR will reject the application (NBDNR 2005). Therefore, it is recommended that wind energy developers work closely with local planning authorities and, in the case of development on crown lands, NBDNR, to improve regulatory efficiency.

It is also important to note that:

- Any wind farm will require the proponent to submit a survey in the form of a Subdivision Plan for approval by the relevant planning authority (Development Officer) and, where Crown lands are involved, by the Minister of NBDNR.
- Prior to construction of the project, the proponent must obtain Building Permits in accordance with the Provincial Building Regulation.
- The planning authority may not issue a Building Permit(s) unless certain requirements are met (e.g., an approved Subdivision Plan).
- Wind farm projects may involve new transmission lines crossing Crown lands which NBDNR may authorize by issuing an easement. Licences of Occupation may also be issued for the same purposes (centre-line work, line clearance, construction) in advance of the issuance of an easement to a transmitter.

A further consideration for developers is in the movement of turbine components to their site. Many of these associated parts can be quite long, depending on the overall size of the structure, and can therefore be an issue to transport. The *Vehicle Dimensions and Mass Regulation - Motor Vehicle Act* provides the dimensions for size and mass that require special permits from NBDOT.

3.2 Hydroelectric

New Brunswick has a number of hydroelectric utilities taking advantage of its many rivers, streams, and other waterways. Currently, NB Power generates 26 percent of its electricity from these hydroelectric facilities, (895 MW of capacity). The smallest NB Power-owned facility is Milltown, at 4 MW, while the largest is Mactaquac, at 672 MW. A map showing the system of NB Power-owned hydroelectric facilities is provided in Figure 8. Note that there are several other hydro facilities not owned by NB Power.

Figure 8 NB Power System Map, Hydroelectricity

www.nbpower.com

There is potential for small scale hydroelectricity development in the province. The last known study of this potential, *Identification of Environmentally Compatible Small Scale Hydroelectric Potential in Atlantic Canada*, was written in 1984. Much of the information provided is still relevant. The report shows that New Brunswick has 52 "potentially practical" sites (meaning that their energy potential compared to the cost of development was good), with a theoretical total installed capacity in the order of 340 MW (Hutt 1984). The most viable site, at St. George, has since been re-developed to increase its generating potential. The potential exists for expansion of existing facilities and the construction of additional new small-scale, low-impact hydro facilities.

Details on some of the regulations and policies that could apply to hydroelectric developments are provided in the following sections.

3.2.1 Environmental Assessment Process

An overview of the EA requirements for hydroelectric projects is provided in the following sections, building on the basic information provided in Section 2.2.

3.2.1.1 Federal

An EA under the *CEAA* is likely to be required for any hydroelectric project. The Department of Fisheries and Oceans (DFO) and Transport Canada are the most likely federal authorities with regulatory responsibilities to require an EA on a hydroelectric project by virtue of the following *Law List Regulation* triggers:

- issuance of authorization by DFO for work related to the construction of the hydroelectric generating facilities with the potential for harmful alteration, disruption or destruction of fish habitat pursuant to the *Fisheries Act*, fish mortality or impediment to fish migration; and
- issuance of a permit by Transport Canada for the construction of the hydroelectric generating facilities pursuant to sub-section 5(1) and 6(4) of the *NWPA*.

Table 3.4 outlines some potential triggers of *CEAA* for a hydroelectric project in the *Fisheries Act*.

Table 3.4 Fisheries Act, Law List Regulations Triggers and their Relevance to a Project

Section of *Fisheries Act*	Nature of Authorization	Relevance to Project
Subsection 22(1)	Pertaining to the provision of flow and passage for the descent of fish at an obstruction.	Applicable if damming a river or other water courses for the purposes of supplying fresh water to a project or to facilitate the project (hydroelectric).
Subsection 22(2)	Provision of fish passage during construction of an obstruction	Applicable if damming of a water course is being considered.
Subsection 22(3)	Downstream flow requirements below a dam for the protection fish habitat.	May be applicable due to changes to downstream flow release with the creation of a reservoir.
Section 32	Destruction of fish (mortality).	May be required to address fish mortality for any in-water works during construction that may result in the killing of fish by means other than fishing, or for the operation or any cooling water intake, discharge structure, dam, causeway.
Subsection 35(2)	Harmful alteration, disruption or destruction of fish habitat (HADD).	Required for any in-water (freshwater or marine) works that may result in the killing of fish by means other than fishing.

If a project involves any of the Comprehensive Study triggers (listed in Section 2.2.1.3) it will require a comprehensive study under the *CEAA*.

3.2.1.2 Provincial

A hydroelectric project would trigger the provincial EIA process if the project is greater than 3 MW or involves one of the other activities listed in Schedule A of the EIA Regulation (as provided in Section 2.2.2). In the event that a provincial EIA registration is required, sector specific guidance exists for hydroelectric projects at www.gnb.ca/0009/0377/0002/0004-e.asp and should be reviewed in detail during the planning stages of the project.

A site selection study is required and the results presented in the EIA registration must include the following:

- a description of any potential alternatives to the project and their feasibility (e.g., if the impounded area is being created for water supply, discuss the feasibility of any alternatives to the project, such as the use of groundwater);
- a description of all alternative sites that were considered and the existing environmental components potentially affected by each alternative; and
- an explanation of the rationale for the chosen option.

A detailed description of the proposed project must be included which addresses the requirements contained in the Registration Guide. For this class of project the required information should include at a minimum:

- details on the site layout (i.e., show the proposed dam/causeway/impoundment location and the location of other required construction areas. Include dimensions of these features – *e.g.*, the size and maximum depth of any impounded areas);
- details on the design of the proposed dam/causeway (i.e., layout, geometry, core and facing material, spillway location and design);
- accessibility of site, including any additional access routes to be constructed (indicate if additional routes are temporary or permanent);
- provide details on any stream crossings (i.e., temporary/permanent, culvert, bridge); and
- the dam classification according to the Canadian Dam Safety Guidelines (available on the internet at the address provided in Appendix A of the Registration Guide).

The detailed description of the proposed construction activities and methods should include at a minimum:

- describe the location of any stock piles, spoil piles and/or waste rock storage areas (including the dimensions);
- if drilling or blasting is anticipated, provide details on where, how much, anticipated charge size and the location of adjacent streams to potential blast sites;
- provide preliminary details on construction of any stream diversions;
- describe clearing and grubbing activities, including fate of any merchantable timber and topsoil removed during these activities; and
- discuss any excavation associated with dam construction, (i.e., depth, width, excavation method).

Details on the operation and maintenance of the project must include such items as inspection and maintenance schedules, seasonal manipulation of water levels, sluice gate operation for high flow by-pass, turbine operation and maintenance, other monitoring initiatives such as water chemistry monitoring. Information on contingency plans and emergency response plans (e.g. in the event of a water-control structure breach) should be provided. The frequency of dam safety review as dictated under the Canadian Dam Safety Guidelines should be indicated.

Additional information regarding future modifications, required description of existing environment, and proposed mitigation is also provided in the sector guidance. The focus is on wildlife habitats and hydrology although all anticipated impacts should be described and discussed and these will depend on the scope and complexity of the project as well as the project location.

3.2.2 Federal Legislation

Other federal legislation or policies which may also apply to certain hydroelectric projects are listed in Table 3. 5.

Table 3.5 Potentially Applicable Federal Legislation or Codes – Hydroelectric

Legislation / Code	Department/Agency	Application to Project	Activity or Component
Species at Risk Act	Fisheries and Oceans Canada, Environment Canada	Kill, harm, possess, buy/sell an endangered species, or damage or destroy its residence S. 32, 33, 36	Construction of facilities, particularly from disturbance during clearing and site preparation
Dominion Water Power Regulation	Department of Indian Affairs and Northern Development	'small water power' development S. 69	Construction of small water power
Canada Shipping Act and Regulations	Transport Canada	--	Shipping activities during construction
Navigable Waters Protection Act	Transport Canada	NWPA permit under S. 5(1)(a) or 6(4) to allow for an interference to navigation; Disposal of waste S. 21	Works or construction activity in navigable waters
Navigable Water Works Regulation	Transport Canada	Maintain access to work, and keep records of water flow and level S. 7	Construction and maintenance of dam or power plant in navigable water
National Building Code; National Fire Code; National Plumbing Code; National Energy Code for Buildings.	National Research Council, Natural Resources Canada	Building, fire, plumbing, and electrical permits	Construction and Operation of the Project

The *Navigable Waters Works Regulation* provides a list of requirements that the developer must follow, including permitting the transport of logs through the work, as well as passage for the public, by vehicle or foot, between the upper and lower reaches of the river affected. Further, the developer shall provide records of the flow and elevation of the water above and below the facility, which must be maintained within prescribed constraints, and which may be measured by the authorities (S.7). Under both the *Dominion Water Power Regulations* (S.69) any hydroelectric developer must apply to the appropriate Minister in order to receive a permit to proceed with the proposed project. Once approved, the project must be maintained in good working condition at all times.

3.2.3 Provincial Legislation

Other provincial legislation or local codes which may apply to certain hydroelectric projects are listed in Table 3.6.

Table 3.6 Potentially Applicable Provincial Legislation – Hydroelectric

Legislation	Department/Agency	Application to Project	Trigger Activity or Component
Watercourse and Wetland Alteration Regulation	Department of Environment	S.15(1)(b) Permit for a Watercourse and Wetland Alteration	Facilities constructed within 30 m of a wetland or watercourse.
Protected Natural Areas Act	NB Department of Natural Resources	S. 11 Prohibition of activities in Class 1 Protected Natural Areas S. 12 Prohibition of activities in Class 2 Protected Natural Areas	Construction or operation of a project in protected areas
Topsoil Preservation Act	NB Department of Environment	Removal of topsoil S. 2, 3, & 4	Construction and Operation of a development
Provincial Building Regulation – Community Planning Act	NB Department of Local Government	Building permits	Construction and Operation of the Project
Electrical Installation and Inspection Act	Department of Public Safety	S.4(1) Requirement to meet installation standards	All electrical systems and equipment with exceptions of electrical and communication utility systems, equipment and wiring on aircraft, ships, trains and automotive equipment, motor rewinding and repairing of radios and other electronic equipment
Endangered Species Act	NB Department of Natural Resources	S. 3 Kill, injure, disturb an endangered species, or destroy or disturb their shelter or habitat	Construction of facilities, particularly from disturbance during clearing and site preparation
Crown Lands and Forests Act	NB Department of Natural Resources	Lease of Crown land	Crown land lease of waterway
Motor Vehicle Act	NB Department of Transportation	Special Permits for moving large structures	Transporting large structures or masses on NB highways
Highway Act, Highway Usage Regulation	NB Department of Transportation	Application for public property easements	Installation of utility lines along public highways

The New Brunswick Department of Natural Resources is responsible for the lease of Crown land in the province, under the *Crown Lands and Forests Act* and should therefore be consulted for requirements of a hydroelectric facility. For a hydroelectric project, a *WAWA* permit would be required from the NBENV as work would be conducted within 30 m of a watercourse (see Section 2.4). Additional requirements under such acts as the *Endangered Species Act*, *Topsoil Prevention Act* and others would depend on site specific characteristics. The *Motor Vehicle Act* should be consulted for permitting requirements for the transportation of large project components to the site. NBDOT should be consulted for further details.

3.3 Biomass

New Brunswick is a province with abundant natural resources, and is considered one of the world leaders in forest management. Declines in the value of forestry industry exports in recent years have highlighted the importance of creating economic opportunity, cutting operating costs, and increasing self-sufficiency of forestry operations. By-products associated with forestry operations including wood chips, sawdust and other biodegradable material can all be viable fuels for a biomass energy project. Biomass is a renewable fuel and the combustion of biomass is not considered in most regulatory frameworks to contribute to net global GHG emissions as it is considered to be part of the global carbon

cycle. Reporting the CO_2 emitted from industrial biomass combustion is required, but CO_2 emission reduction is unlikely to be regulated, although other GHG emissions from biomass, (CH_4, N_2O, generally small) are likely to be regulated. Many industrial facilities have, therefore, benefited from the combustion of biomass to displace other energy forms, thereby reducing their facility GHG emissions.

The NBDNR policy, *Harvesting*, provides guidance on the use of biomass in a sustainable fashion. The policy directs potential harvesters of biomass to consult mapping data, as well as on-the-ground research, to identify the most viable locations to gather the resource. The analysis will include climate, soil, nutrient demand, growth rates, and other aspects to ensure sustainable use of the resource. The harvesting is restricted to above-ground components - residual tree tops, branches, foliage, non-merchantable woody stems of trees and shrubs, pre-existing dead woody material and flail chipping residue, as opposed to roots and stumps. This provides an opportunity for wood producers and others to make use of this biomass resource to produce energy and reduce operational cost, or to create a value-added product.

There are facilities in New Brunswick using biomass to produce electricity, with some using cogeneration (heat/steam generation combined with electricity generation) technology to improve the efficiency of their operation.

Other biofuels as well as landfill gas or wastewater generated biogas are also considered biomass. Use of these types of fuel for electricity production is not common practice currently in New Brunswick. A Bio-Oil Development Centre pilot project is being undertaken by Greenway Oils Inc. in Waterville, Carleton County. Bio-Oil can be made from oil seed crops such as soya bean, mustard seed, and canola as well as other sources. Bio-D is an integrated dairy feed service company in Clair that is producing biodiesel from canola for use in their own fleet, and using the "waste" canola product as a protein supplement in their dairy rations.

Details on the regulations and policies that could apply to biomass energy developments are provided in the following sections.

3.3.1 Environmental Assessment Process

An overview of the EA requirements for biomass energy projects is provided in the following sections. Section 2.2 should be reviewed for basic background information on EA. The NBENV and CEA Agency should be consulted regarding EA requirements for specific projects.

3.3.1.1 Federal

A screening level EA under *CEAA* could be required in the event of a trigger such as federal land use or federal funding. Should surface water withdrawal from a nearby watercourse be pursued, authorizations under the *Fisheries Act* and the *Navigable Waters Protection Act* would also require an EA under *CEAA* to be conducted as these are *Law List Regulations* triggers.

3.3.1.2 Provincial

A biomass combustion electric generation system would be subject to the provincial EIA process in the event that it is greater than 3 MW or contains any other items listed in Schedule A of the EIA Regulation (as provided in Section 2.2.2).

Although there are no NBENV sector specific guidance documents for biomass, the EIA registration document should contain, in addition to the general requirements, the following.

- estimated annual emissions of air contaminants (particulate matter, nitrogen oxides, carbon monoxide as a minimum);
- air contaminant dispersion modelling results to predict environmental effects on ground level air quality in the area;
- details on water supply and assessment of potential environmental effects in the event that the system needs water input (boiler);
- details on storage of biomass, waste generation (waste water, ash, other) and management;
- details on management of site run-off;
- if on-site ground water is used and the capacity of the on-site groundwater wells will be greater than 50 m^3/day, this is an EIA triggerunder Schedule A and requires a Water Supply Source Assessment (WSSA) be conducted; and
- information on the source of the biomass and the impact of its use on forests or agricultural soils.

Sector specific guidelines from NBENV do exist for Waste Disposal Sites (including but not limited to municipal solid waste landfill sites, industrial landfills, tailing ponds, and waste incineration facilities). An EIA registration would be required to complete a modification to an existing site such as the addition of a landfill gas collection system or a biodigester at a waste management site.

Although electricity generation is not specifically mentioned in the sector specific guidelines for waste disposal sites, the guidelines do outline that all air emissions that may result from the operation of the project should be characterized, dispersion modelling of air contaminant emissions should be conducted and environmental effects on groundwater, noise and odour should be included at a minimum. The NBENV Sector Guidelines are at www.gnb.ca/0009/0377/0002/0004-e.asp .

3.3.2 Federal Legislation

Other federal legislation or codes that may apply to biomass projects are listed in Table 3.7.

Table 3.7 Potentially Applicable Federal Legislation – Biomass Energy

Legislation / Code	Department/Agency	Application to Project	Activity or Component
Canadian Environmental Protection Act	Environment Canada	Release of toxic substances S. 95; Production, import, or selling of fuel with specific requirements S. 139 (1); Air pollutants S. 167, 171; Water pollutants S.177, 181.	Hazardous material and POL storage, NPRI Reporting, Environmental Emergencies Regulations
Fisheries Act	Fisheries and Oceans Canada, Environment Canada	S.36 Authorization for deleterious substances	Release of wastewater into waterways

Table 3.7 Potentially Applicable Federal Legislation – Biomass Energy

Legislation / Code	Department/Agency	Application to Project	Activity or Component
National Building Code; National Fire Code; National Plumbing Code; National Energy Code for Buildings	National Research Council, Natural Resources Canada	Building, fire, plumbing, and electrical permits	Construction and Operation of the Project

Any wastewater must meet the requirements of the federal *Fisheries Act*. Biomass projects would need to estimate annual emissions to air and water of NPRI reportable compounds and review NPRI reporting requirements to see if a report is required under *CEPA*.

3.3.3 Provincial Legislation

Other provincial legislation which may apply to biomass projects is listed in Table 3.8.

Table 3.8 Potentially Applicable Provincial Legislation – Biomass Energy

Legislation	Department/Agency	Application to Project	Activity or Component
Air Quality Regulation – Clean Air Act	NB Department of Environment	Section 3(1)(a) Approval to Construct and Approval to Operate a Source; S. 14 Approval to release smoke	Construction of air contaminant emission source; Operation of air contaminant emission source.
Water Quality Regulation – Clean Environment Act	NB Department of Environment	S. 3(2) Discharge into waters of the Province; S. 3(3) Approval to Construct and Approval to Operate for the wastewater treatment system; S. 3(4) Sewage work and approval to discharge; S. 3(5) Approval for construction/operation of waterworks; S 3(6) Connecting to a municipal water system	Construction (site run-off); Operation of wastewater treatment, cooling water, and sanitary wastes systems; Construction and Operation of water mains; Withdrawal of water during Construction and Operation.
Clean Water Act and Regulations (including *Watercourse and Wetland Alteration Regulation*)	NB Department of Environment	S. 12(1) Release of contaminant into or upon water; S. 15(1)(b) Permit for a Watercourse and Wetland Alteration	Construction requiring watercourse or wetland alteration (construction within 30 m of waterway)
Petroleum Product Storage and Handling Regulation	NB Department of Environment	Approval of any petroleum storage tanks	Any on-site petroleum storage
Crown Lands and Forests Act	NB Department of Natural Resources	28-30, apply for crown land for forestry purposes Timber Regulation – 9-10, wasteful cutting practices prohibited,	Use of Crown land for project, timber from crown land

Table 3.8 Potentially Applicable Provincial Legislation – Biomass Energy

Legislation	Department/Agency	Application to Project	Activity or Component
Provincial Building Regulation – Community Planning Act	NB Department of Local Government	Building permits	Construction and Operation of the Project
Boiler and Pressure Vessel Act	NB Department of Public Safety	S. 13 requires certificate of inspection; S. 113(1) requires permit to install boilers or pressure vessels	Construction and Operation of boilers and pressure vessels
Fire Prevention Act Section 23 (c)	NB Department of Public Safety	--	fire prevention, control, and response systems
Transportation of Primary Forest Products Act	NB Department of Natural Resources	Operating, importing or exporting a vehicle with primary forest products S. 2	Forestry or food products development
Forest Products Act	NB Department of Natural Resources	S. 12(2) Forest Industries, consumers and producers to report on operations	Operations and production of forest products

Process wastewater, cooling water and surface run-off from the biomass storage area and other areas of the site must be treated to meet the requirements of the *Water Quality Regulation* under the *New Brunswick Clean Environment Act*.

Any petroleum storage tanks on-site must be registered and meet other requirements of the *Petroleum Product Storage and Handling Regulation – Clean Environment Act*. Pressure vessels and/or boilers would be subject to the *Boiler and Pressure Vessel Act*.

Biomass based renewable electricity generation involves a combustion process that results in air contaminant emissions. These systems are regulated provincially in the same manner as other combustion sources with respect to emissions to air. The operation of fuel burning equipment is regulated under the provisions of the *Air Quality Regulation 97-133* under the *Clean Air Act*. Specifically, Section 3(1) requires that any source of contaminants to the atmosphere must apply for and obtain a Certificate of Approval to Operate.

If the sole source of emissions at a facility is from fuel burning, and if these facilities have a combined total heat input rating of less than 2.7 million kJ/hr, they are exempt from the requirement to obtain an Approval under *Air Quality Regulation* (Section 4).

Biomass facility Approvals will be classified in one of five standard classifications. These classes are established according to the amount of contaminants released to the environment. The higher the amount of contaminants released, the more detailed the conditions of the approval are likely to be. Annual fees are assessed for approvals according to the class to recover the costs associated with the administration of the Approval.

For large facilities, a 180-day public participation process may be required prior to the issuance or renewal of the Approval to Operate.

3.4 Tidal Energy

Tidal energy has become a recent focus of attention as a result of a North American-wide study of tidal power potential that included an analysis of the Bay of Fundy's world's highest tides and strong ocean currents. Tidal energy can be harnessed to generate electricity from tides, currents and waves. The Electric Power Research Institute (EPRI) completed a report titled "North American Tidal In-Stream Energy Conversion Feasibility Study, New Brunswick" in 2006 which indicated that approximately 90 MW is achievable using currently available in-stream technology. (EPRI 2006)

Currently, no large scale tidal electrical generation is permitted in New Brunswick. The NBDNR has developed an interim policy "Allocation of Crown Lands for Research in Support of In-Stream Tidal Power Generation" (NBDNR 2007). It prohibits large scale tidal development and provides guidelines for research of in-stream tidal energy. This tidal policy will be further developed by the government in the near future. Based on the results of research projects, regulation will evolve on commercial tidal developments.

Information on the existing regulations, codes and policies that could apply to tidal energy developments once they are permitted is provided in the following sections.

3.4.1 Environmental Assessment Process

Given the current NBDNR policy on tidal energy development, there are no potential activities in the province that would require provincial or federal environmental assessment.

3.4.1.1 Federal

Potential future tidal energy projects will likely require an EA under *CEAA*. Proponents, partners and provincial bodies will facilitate the deployment of tidal energy devices. The deployment and operation of tidal energy projects may require *Law List Regulation* authorizations under the *Fisheries Act* (for harmful alteration, loss, disruption or destruction of fish habitat); under the *Navigable Waters Protection Act*; and, possibly, an Ocean Dredging and Disposal permit under *CEPA*.

Tidal energy projects would require a comprehensive study level of assessment under *CEAA* in certain circumstances as outlined in Sections 6 and 7 as follows:

> *6. The proposed construction, decommissioning or abandonment of a tidal power electrical generating station with a production capacity of 5 MW or more, or an expansion of such a station that would result in an increase in production capacity of more than 35 per cent.*
>
> *7. The proposed construction of an electrical transmission line with a voltage of 345 kV or more that is 75 km or more in length on a new right of way."*

Also, a project in a port designated under the *Canada Marine Act* and administered by a Canada Port Authority may require an environmental assessment under the *Canada Port Authority Environmental Assessment Regulation* under *CEAA*.

3.4.1.2 Provincial

Currently no large scale tidal project can be permitted in New Brunswick. In future cases where a disposition is granted (and assuming no additions to the current EIA Regulation), proposed tidal energy

projects may trigger an EIA, if the applications correspond to one of the undertakings described in Schedule A of the EIA Regulation as indicated in Section 2.2.2.

3.4.2 Federal Legislation

Other federal legislation which may apply to tidal energy projects is listed in Table 3.9.

Table 3.9 Potentially Applicable Federal Legislation – Tidal Energy

Legislation	Department/Agency	Application to Project	Activity or Component
Canada National Marine Conservation Areas Act	Environment Canada	Use or occupancy of public lands S.12; Exploration and Exploitation for minerals, etc. S. 13; Disposal of substances S. 14; Pollution Clean-up S. 29	Works or construction activity in conservation waters
Canadian Environmental Protection Act; Ocean Dredging and Disposal permit	Environment Canada	Release of toxic substances S. 95; Water pollutants S.177, 181	Hazardous material and POL storage, NPRI Reporting, Environmental Emergencies Regulations, Ocean Dredging or Disposal
Canada Water Act	Environment Canada	waste disposal in the water quality management area S. 9	Shipping, work, or construction activities in Canadian waters
Fisheries Act	Fisheries and Oceans Canada, Environment Canada	S.20 Fish passage HADD authorization (S. 35(2); Authorization for destruction of fish (S. 32); Authorization for deleterious substances (S. 36)	Construction of water based infrastructure;
Navigable Waters Protection Act	Transport Canada	NWPA permit under S. 5(1)(a) to allow for an interference to navigation;	Works or construction activity in navigable waters
Natural and Man-made Harbour Navigation and Use Regulations	Transport Canada	Obstruction, interference, diversion or otherwise negatively affect a harbour S. 3	Construction, operation or decommissioning of facility

As noted in the section on general regulations, some of these regulations make specific reference to the obstruction of waterways. *Natural and Man-made Harbour Navigation and Use Regulations* (S.3) makes special note that these waterways cannot be obstructed so as to maintain proper water flow, ensure safety, not be a nuisance to users of harbours or negatively affect water quality. *Fisheries Act* regulations protect fish passage, against fish destruction and habitat alteration, and limit releases of deleterious substances.

3.4.3 Provincial Legislation

Other provincial legislation which may apply to tidal energy projects is listed in Table 3.10.

Table 3.10 Potentially Applicable Provincial Legislation – Tidal Energy

Legislation	Department/Agency	Application to Project	Activity or Component
Interim Policy - Allocation of Crown Lands for Research in Support of In-Stream Tidal Power Generation	NB Department of Natural Resources	Whole document	Deals with research opportunities for exploring tidal energy
Clean Water Act and Regulations (including *Watercourse and Wetland Alteration Regulation*)	NB Department of Environment	S. 15(1)(b) Permit for a Watercourse and Wetland Alteration	Construction of linear facilities

The *Clean Environment Act, Water Quality Regulation* (S.3(3)) places restrictions on the obstruction of a water source.

The NBDNR interim policy for the *Allocation of Crown Lands for Research in Support of In-Stream Tidal Power Generation* (NBDNR 2007) provides guidelines for research of in-stream tidal energy that would be developed in waters under the jurisdictional control of the Province.

For those researching marine energy, you must demonstrate capacity in terms of in-house expertise or partnerships with research institutions, marine energy industry associations or educational institutions. Research activities allowed and restricted are summarized in Table 3.11.

Table 3.11 Research Activity Allowance and Restrictions – Tidal Energy

Permitted Activities	Non-Permitted Activities
• data collection and analysis on water currents such as flows, motions, forces and strengths; • data collection and analysis on climatic conditions such as air and water temperatures, weather conditions and storm influences; • collection of baseline data of the natural environment such as bedrock and ocean floor geology, sediment transfer, and erosion activity; • collection of baseline data of behaviour and activities of wildlife, birdlife, fish and whales, such as migration routes, nesting areas and breeding grounds; and • evaluating scale models of tidal in-stream power generating devices through their operation in towing tests, floating tests or tests performed by having models attached to barges or boats.	• development of commercial in-stream tidal power generation sites; • development of wave power generation sites; • development of off-shore wind power generation sites; • connection to utility power grids; and • activity that would trigger an EIA/EA under the *Clean Environment Act* or an environmental assessment under the *CEAA*.

Further, the interim policy sets constraints on the setbacks of the research site. Locations proposed for dispositions shall:

- be identified by GPS coordinates on a map, chart or aerial photograph;
- be no larger than 25 hectares in surface area with a minimum width or length of no less than 250 metres;

- be located a minimum of 1,000 m away from any other site;
- be located a minimum 100 m away from:
    - operating aquaculture sites;
    - operating commercial or industrial sites;
    - designated navigation channels and shipping lanes;
    - submarine cables and pipelines;
    - wharfs; and
    - species at risk habitat and marine protected areas.
- not contain areas such as:
    - operational submerged dumping sites;
    - existing Crown lands dispositions;
    - wrecks and other sites of archaeological merit;
    - wildlife nesting areas and migration routes; and
    - weirs and weir sites (NBDNR 2007).

Only the area required for an easement, license of occupation or right-of-way shall be made available. The running of utilities and roads lengthwise through Crown Waterfront Reserves shall be discouraged. There are a number of restrictions on the use of such areas in the *Crown Lands and Forests Act*.

Any tidal energy projects and associated structures and operations proposed in coastal areas and on submerged crown land in New Brunswick will be subject to NBDNR approval and, in some cases, tenure (lease, license, or easement), as noted in the *Submerged Land Policy* (NBDNR). Submerged Crown Land is land located seaward of the average height of high tide (also referred to as the ordinary high water mark). The policy relates to "all development activities and other specific uses involving submerged lands under the administration and control of the Minister of Natural Resources, except those within a Protected Natural Area." It does not deal with requests for land acquisition, disposal or unauthorized occupations. Authority for the policy is granted by Sections 23 to 26 of the *Crown Lands and Forests Act*. Section 10.5 requires public utilities, including pipelines, telecommunications cables and power cables to seek an easement. The easement is subject to compliance with conditions c) through k) of section 10.1 of the policy, Access Structures or Works.

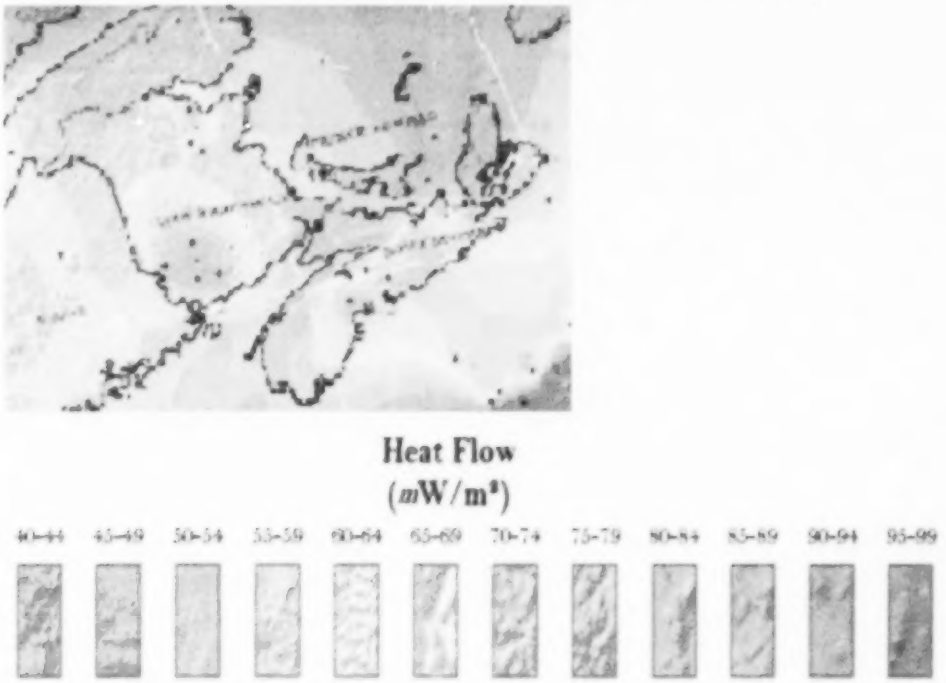
3.5 Geothermal

Geothermal energy advantages include low emissions, strong return on investment and ability to meet all of the heating, cooling, and water heating needs of a building. Geothermal energy generally increases at depth with a gradient and geographic reach that makes some form accessible virtually everywhere. Various forms of technology have been developed to use earth energy from residential heat pumps to sophisticated hydrogeologic turbine sites. It is estimated that the amount of heat within 10,000 metres of the earth's surface contains 50,000 times more energy than all the oil and natural gas

resources in the world. Further, geothermal facilities that generate electricity claim an average standby availability of 97%.

The Canada Renewable Energy Network indicates that geothermal electrical facilities in California, Hawaii, Nevada and Utah generated about $1 billion of electricity in 2000, the equivalent to about 10 million barrels of oil (http://www.canren.gc.ca/). They further indicate there are currently 30,000 earth energy installations in Canada. The only mention of a large scale geothermal energy project is a test geothermal site at Meager Mountain in the Pebble Creek area of British Columbia. A 100 MW electrical facility is being contemplated at that site. From the geothermal mapping of North America (American Association of Petroleum Geologists; Figure 9), New Brunswick has modest geothermal potential, particularly in the southwest and the northeast.

Figure 9 Geothermal Map of the Maritime Region (Blackwell, Richards 2004)



Between January and May 2005, there were 483 megawatts of new geothermal power purchase agreements signed in the US. These new projects are located throughout California, Nevada, Arizona, and Idaho, and represent the power generation equivalent of the total of approximately 2,000 megawatts of wind projects operating throughout California. (www.geo-energy.org)

Details on the regulations and policies that could apply to geothermal energy developments in the province are discussed in the following sections.

3.5.1 Environmental Assessment Process

An overview of the EA requirements for geothermal energy projects is provided in the following sections. Section 2.2 should also be reviewed for more general information on the EA process.

3.5.1.1 Federal

A screening level EA under *CEAA* could be required for a geothermal project in the event of a trigger such as federal land use, federal funding or the need for *Law List Regulations* permit.

3.5.1.2 Provincial

A geothermal installation that would produce over 3 MW of electricity or one including another activity listed in Schedule A of the *EIA Regulation* would trigger an EIA (Section 2.2.2). Requirements for the EIA would vary depending on the location but would likely include assessment of potential environmental effects to groundwater, surface water and terrestrial habitat at a minimum. The NLENV and their EIA Guidelines should be consulted early in the planning stage of a geothermal project.

3.5.2 Federal Legislation

There are a number of regulations which may apply to a geothermal project development, depending on the location, size, and construction of the project. Federal legislation and codes which may apply to geothermal projects is listed in Table 3.12.

Table 3.12 Potentially Applicable Federal Legislation – Geothermal

Legislation	Department/Agency	Application to Project	Activity or Component
Migratory Birds Convention Act	Environment Canada	Possess or otherwise use a migratory bird nest S. 5; Use of substances harmful to migratory birds S. 5.1	Construction of facilities, particularly from disturbance during clearing and site preparation
Species at Risk Act	Fisheries and Oceans Canada, Environment Canada	Kill, harm, possess, buy/sell an endangered species, or damage or destroy its residence S. 32, 33, 36	Construction of facilities, particularly from disturbance during clearing and site preparation
National Building Code; National Fire Code; National Plumbing Code; National Energy Code for Buildings.	National Research Council, Natural Resources Canada	Building, fire, plumbing, and electrical permits	Construction and Operation of the Project

Table 3.12 Potentially Applicable Federal Legislation – Geothermal

Legislation	Department/Agency	Application to Project	Activity or Component
Transportation of Dangerous Goods Act, 1992	Transport Canada	Section 31 – Permit may be required for transportation	Transportation of dangerous goods, including hazardous materials

Many of the above regulations consider the location of the project and may be avoided with proper site planning. The most relevant regulations would be in the possible site construction, such as the use of explosives under the federal *Explosives Act*.

3.5.3 Provincial Legislation

Provincial legislation that may apply to geothermal projects is listed in Table 3.13.

Table 3.13Potentially Applicable Provincial Legislation – Geothermal

Legislation	Department/Agency	Application to Project	Activity or Component
Water Quality Regulation – Clean Environment Act	NB Department of Environment	S. 3(2) Discharge into waters of the Province; S. 3(3) Approval to Construct and Approval to Operate for the wastewater treatment system; S. 3(4) Sewage work and approval to discharge; S. 3(5) Approval for construction/operation of waterworks; S 3(6) Connecting to a municipal water system	Construction of facilities; Operation of wastewater treatment, cooling water, and sanitary wastes systems; Construction and Operation of water mains; Withdrawal of water during Construction and Operation.
Clean Water Act and Regulations (including *Watercourse and Wetland Alteration Regulation*)	NB Department of Environment	S. 12(1) Release of contaminant into or upon water; S. 15(1)(b) Permit for a Watercourse and Wetland Alteration	Construction/operation of facilities within 30 m of watercourse Process water releases into watercourses
Protected Natural Areas Act	NB Department of Natural Resources	S. 11 Prohibition of activities in Class 1 Protected Natural Areas S. 12 Prohibition of activities in Class 2 Protected Natural Areas	Construction or operation of a project in protected areas
Crown Lands and Forests Act (including Leasing Regulation and Timber Regulation)	NB Department of Natural Resources	Lease of crown land	Use of crown lands or forests

Table 3.13Potentially Applicable Provincial Legislation – Geothermal

Legislation	Department/Agency	Application to Project	Activity or Component
Ozone Depleting Substances and Other Halocarbons Regulation – Clean Air Act	NB Department of Environment	S. 4 Release or use of ozone depleting substances; S. 14 Record keeping and reporting for ozone depleting substances; S.15 maintenance requirements for equipment containing ozone depleting substances	Construction and Operation of refrigeration, air conditioning, and fire suppression systems associated with the facilities
Topsoil Preservation Act	NB Department of Environment	Removal of topsoil S. 2, 3, & 4	Construction and Operation of a development
Provincial Building Regulation – Community Planning Act	NB Department of Local Government	Building permits	Construction and Operation of the Project
Boiler and Pressure Vessel Act	NB Department of Public Safety	S. 13 requires certificate of inspection; S. 113(1) requires permit to install boilers or pressure vessels	Construction and Operation of boilers and pressure vessels
Endangered Species Act	NB Department of Natural Resources	S. 3 Kill, injure, disturb an endangered species, or destroy or disturb their shelter or habitat	Construction of facilities, particularly from disturbance during clearing and site preparation
Electrical Installation and Inspection Act and Regulations	NB Department of Public Safety	S. 4(1) requirement to meet electrical installation standards; Approval for electrical installation	Construction and Operation of a Project
Motor Vehicle Act	NB Department of Transportation	Special Permits for moving large structures	Transporting large structures or masses on NB highways
Highway Act, Highway Usage Regulation	NB Department of Transportation	Application for public property easements	Installation of utility lines along public highways

Depending on the type of material used for the transfer of heat to and from the earth's surface, developers may have to receive a permit under the *Ozone Depleting Substances and Other Halocarbons Regulation – Clean Air Act*. Similarly, if a geothermal facility uses boilers or pressure vessels, they would be governed by the *Boiler and Pressure Vessel Act*.

Environmental effects on groundwater and/or water supply could be a primary concern for geothermal energy development that uses a technology which employs large amounts of water, or fluids that could contaminate the adjacent soil or groundwater, as a heat transfer medium.

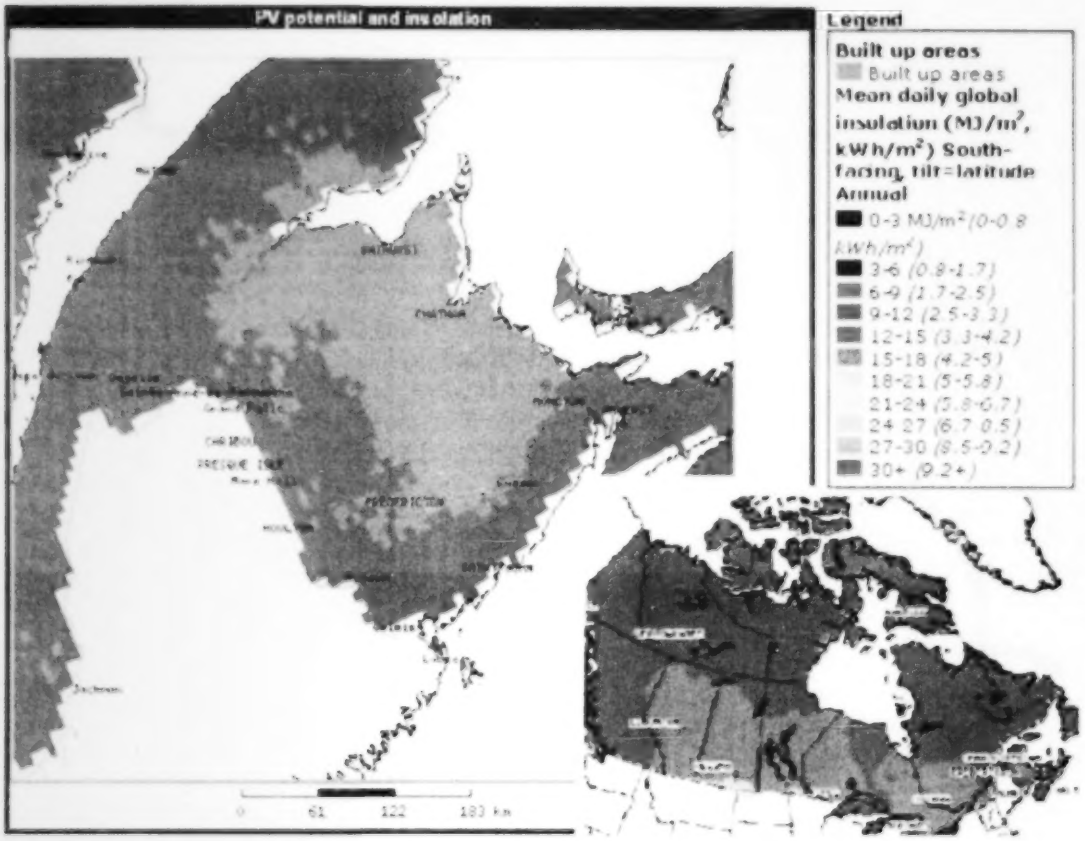
3.6 Solar

The most prohibitive factor facing solar energy developers, especially photovoltaic projects, is the cost per kWh being much higher than for competing energy sources. The Centre for Energy www.centreforenergy.com finds "the cost of production costs for PV cells have come down steadily

over the last decade to between 50 cents to 30 cents per kilowatt-hour, and lower for some applications. Based on this progress, Industry Canada predicts that industry could further reduce generation costs to between eight (8) and 14 cents per kilowatt-hour between 2010 and 2020."

New Brunswick does not receive as much solar energy (4-5 kWh/m^2) as more favourable locations such as Nevada (6-7 kWh/m^2) (http://www.bergey.com/Maps/U.S.Solar.htm) as illustrated in (Figure 10) (https://glfc.cfsnet.nfis.org/mapserver/pv/index.php).

Figure 10 Solar Energy Map of New Brunswick with Canada Map Insert



It is likely in the near future that solar energy produced by photovoltaic panels will be used in niche applications where the grid may not be readily available (highway signage and traffic signalization) and by home and cottage owners.

One application that is becoming cost effective is solar thermal energy. Energy from the sun can be used to heat air or water relatively efficiently, and technology for this application is more readily available. However, this form of solar energy is most commonly used on a small scale, for small commercial or, most often, residential purposes.

Details on the regulations and policies that could apply to solar energy developments are provided in the following sections.

3.6.1 Environmental Assessment Process

An overview of the EA requirements for solar energy projects is provided in the following sections. Section 2.2 should be reviewed for general background information on EA requirements.

3.6.1.1 Federal

A screening level EA under *CEAA* could be required in the event of a trigger such as federal land use or federal funding.

3.6.1.2 Provincial

A solar installation over 3 MW or a solar project involving another activity listed in Schedule A of the *EIA Regulation* would trigger an EIA (Section 2.2.2). Requirements for the provincial assessment would vary depending on the location of the project but would likely include assessment of potential environmental effects to birds and bird habitat and terrestrial environment at a minimum. The NBENV should be consulted early in the planning stage of any substantive solar project to clarify potential EIA requirements.

3.6.2 Federal Legislation

Key federal legislation that may apply to solar energy projects is outlined in Table 3.14.

Table 3.14 Potentially Applicable Federal Legislation – Solar Energy

Legislation	Department/Agency	Application to Project	Activity or Component
Migratory Birds Convention Act	Environment Canada	Possess or otherwise use a migratory bird nest S. 5; Use of substances harmful to migratory birds S. 5.1	Construction of facilities, particularly from disturbance during clearing and site preparation
Species at Risk Act	Fisheries and Oceans Canada, Environment Canada	Kill, harm, possess, buy/sell an endangered species, or damage or destroy its residence S. 32, 33, 36	Construction of facilities, particularly from disturbance during clearing and site preparation

This legislation considers the location of the project. The requirements may be eased with proper site selection and planning. Environmental effects on birds have been observed at the 64 MW solar facility in Boulder City, Nevada. The main issue affecting birds is the large footprint needed for commercial scale solar energy production. There has also been some data on bird strikes collected. Researchers, who have studied avian mortality at Solar One over a 40-week period, documented the death of 70 birds (of 26 species). The estimated morality rate was 1.9-2.2 birds per week; 57 birds (81%) of 20 species died from collisions with Solar One structures, mainly the mirrored surfaces of heliostats; 13 birds (19%) of 7 species died from burns received by flying through "standby" points. The affect of this mortality on the local bird population was found to be minimal (0.6-0.7% per week) (American Bird Conservancy 2008).

3.6.3 Provincial Legislation

Provincial legislation that may apply to solar energy installations is summarized in Table 3.15.

Table 3.15 Potentially Applicable Provincial Legislation – Solar Energy

Legislation	Department/Agency	Application to Project	Activity or Component
Protected Natural Areas Act	NB Department of Natural Resources	S. 11 Prohibition of activities in Class 1 Protected Natural Areas S. 12 Prohibition of activities in Class 2 Protected Natural Areas	Construction or operation of a project in protected areas
Crown Lands and Forests Act (including Leasing Regulation and Timber Regulation)	NB Department of Natural Resources	Lease of crown land	Use of crown lands or forests
Provincial Building Regulation – Community Planning Act	NB Department of Local Government	Building permits	Construction and Operation of the Project
Boiler and Pressure Vessel Act	NB Department of Public Safety	S. 13 requires certificate of inspection; S. 113(1) requires permit to install boilers or pressure vessels	Construction and Operation of boilers and pressure vessels
Endangered Species Act	NB Department of Natural Resources	S. 3 Kill, injure, disturb an endangered species, or destroy or disturb their shelter or habitat	Construction of facilities, particularly from disturbance during clearing and site preparation
Electrical Installation and Inspection Act and Regulations	NB Department of Public Safety	S. 4(1) requirement to meet electrical installation standards; Approval for electrical installation	Construction and Operation of a Project
Highway Act, Highway Usage Regulation	NB Department of Transportation	Application for public property easements	Installation of utility lines along public highways

4.0 FUNDING INCENTIVES

The federal and provincial governments recognize that renewable energy projects have numerous social, economic and environmental benefits; however, many of the technologies are developing and are not yet competitive with established conventional sources of energy. While it is recognized that renewable energy projects have the potential to generate additional revenues in terms of Renewable Energy Credits or Carbon Offset Credits, a gap continues to exist between their revenue requirements and current energy prices. To address these gaps, New Brunswick has introduced the *Electricity from Renewable Resources Regulation* requiring NB Power to purchase and sell a minimum amount of renewable electricity each year. Proposed federal legislation could require NB Power to acquire 33% of renewable energy by 2016 or 10% of new renewable energy (at a rate of 1% per year for ten years) beginning in 2007. Once in place, this legislation will further encourage renewable energy development.

However, in the meantime, the price gap remains. Governments have, therefore, instituted incentive programs to encourage the early development of renewable energy projects. The following sections provide a brief overview of some of the currently available options. Best efforts have been made to ensure this list is as complete and accurate as possible at the time of publication. However, these programs are subject to government budgets and legislation, and could change at any time.

4.1 Federal Funding

The Government of Canada currently supports renewable energy development through the following initiatives:

- ecoENERGY for Renewable Power Program - Financial payment upon production (one (1) cent per kilowatt-hour for up to 10 years to eligible low-impact, renewable electricity projects constructed between April 1, 2007 and March 31, 2011). Visit their website for more information at: http://www.ecoaction.gc.ca/ecoenergy-ecoenergie/power-electricite/index-eng.cfm.
- Technology Early Action Measures (TEAM) - Supports projects that are designed to develop technologies that mitigate greenhouse gas (GHG) emissions. Visit the TEAM website at: http://www.team.gc.ca/english.
- Atlantic Canada Opportunities Agency (ACOA) Business Development Program - Offers access to capital in the form of interest-free, unsecured repayable contributions, focusing on small and medium sized enterprises. More information can be found on their website: http://www.acoa.ca/English/Pages/home.aspx.
- Find current research and investment initiatives supporting Canada's commitment to increase its supply of clean, renewable energy on the Natural Resources Canada website: http://www.nrcan.gc.ca/eneene/renren/index-eng.php.
- Canadian Renewable and Conservation Expenses (CRCE) taxation policy - Expenditures associated with the start-up of renewable energy and energy conservation projects, for which at least 50 percent of the capital costs of the property would be described in Class 43.1, are fully

deductible. Further, Canada Revenue Agency and Natural Resources Canada - Class 43.1 - Capital Cost Allowance (CCA) rate of 30 per cent applies to certain types of renewable energy and energy efficiency equipment.

- Canmet Energy Technology Centre (CETC) - This federal program, under NRCAN, provides funding opportunities for specific areas, such as bioenergy, wind, transportation, fuel cells, and other emerging technologies. For more information, visit the CETC website at the following link: http://canmetenergy-canmetenergie.nrcan-rncan.gc.ca/eng/index.html
- Sustainable Development Technology Canada (SDTC) - This not for profit foundation, created by the Government of Canada, provides funding support for late-stage development and pre-commercial demonstration funding of promising technologies to assist them to become successful in the marketplace. http://www.sdtc.ca/en/index.htm
- The NextGen Biofuels Fund™ - $500 million over eight years for large scale production facilities using new technologies helps support first of kind biofuels development facilities and is administered by SDTC. More information can be found on their website at: http://www.sdtc.ca/en/index.htm#.
- EcoAgriculture offers a number of programs in support of biofuel including the Biofuels Capital Initiative (ecoABC) ($200 million), the Biofuels Opportunities for Producers Initiative (BOPI) ($20 million for feasibility studies), Agriculture Bioproducts Innovation Program (ABIP) ($145 million, 4 years), Agri-Opportunities Program ($134 million) and the Co-operative Development Initiative (1 million).
- EcoEnergy for Biofuels - $1.5 billion operating incentives to biofuel (ethanol) producers over nine years.

4.2 Provincial Government

In addition to the regulatory framework that will encourage renewable electricity development, the Province has adopted a number of objectives in its Climate Change Action Plan that will depend on incentives to encourage their development. These incentives are being made available through two funding programs.

The New Brunswick Climate Action Fund (ecoTrust)

The New Brunswick Climate Action Fund program provides financial support for eligible projects that support the GHG emission reduction objectives outlined in the New Brunswick Climate Change Action Plan, including clean and renewable energy opportunities. The $34 million provided by the Government of Canada's ecoTrust for clean air and climate change is to be distributed over a three year period (2007-2010). For more information, please visit their website: http://www.gnb.ca/0009/0369/0016/0001-e.asp.

The fund is dedicated to public-sector, private-sector and not-for-profit initiatives that will result in reductions or avoidance of greenhouse gas emissions and air pollution throughout the province.

Building Canada Fund (BCF)

The governments of Canada and New Brunswick signed the "Canada - New Brunswick Framework Agreement" on December 7, 2007 worth $541.62 million under the Building Canada plan. The Building Canada Fund (BCF) infrastructure program has the objective of advancing national priorities: a stronger economy, a cleaner environment, and better communities by addressing local and regional infrastructure needs.

The national priority funding categories for the BCF are:

- Core National Highway System;
- Drinking Water;
- Wastewater;
- Public Transit; and
- Green Energy.

Funding will be allocated for projects in the provinces and territories based on their population and all major projects will be selected through federal-provincial/territorial negotiations.

The program will operate through two components.

- The Major Infrastructure Component (MIC) will target larger, strategic projects of national and regional significance.
- The Communities Component (CC) will focus on projects in communities with populations of less than 100,000 – helping these smaller communities face their unique challenges.

The BCF will stimulate investments in sustainable energy infrastructure that contributes to:

- increased availability and/or security of Canada's clean energy supply;
- increased availability of renewable energy;
- improved air quality; and
- reduced GHG emissions.

5.0 CONCLUSIONS AND CLOSURE

Renewable energy growth will be an area of economic development and part of the developing Energy Hub in New Brunswick in the coming years. Renewable energy projects have the potential to support social and environmental objectives and projects can be developed throughout the province. A strong provincial electricity transmission system allows for the efficient addition of renewable electricity projects in most areas. Similarly, an extensive highway network supports the development of renewable energy projects in areas that are most appropriate in terms of the resource requirements.

The Province has adopted an aggressive Climate Change Action Plan, designed to reduce greenhouse gas (GHG) emissions by 5.5 million tonnes by 2012, with a substantive portion of those reductions dependent upon renewable electricity generation and biofuels to reduce dependence on non-renewable fossil fuels.

Despite the undeniable social, economic and environmental benefits associated with renewable energy, there are potential negative environmental and socio-economic effects associated with these technologies. To maintain public support and ensure projects are established such that benefits are maximized and any potential negative aspects are minimized, projects must be developed within appropriate regulatory frameworks, as have been developed over recent years federally and provincially, as well as by local governments. This guidance document provides an overview of key regulations, legislation and policies that currently govern renewable energy development in New Brunswick. This guidance document should be used as a reference to navigate a renewable energy project through the regulatory process. However, this guidance does not replace the benefit of early communication with the appropriate government departments to ensure the most efficient processing of your project and ensure that you are aware of any new requirements.

To efficiently complete a project, the highest risk and longest timeline requirements should be identified and initiated as early as possible. The more prominent processes and requirements that must be navigated include:

- market access and licensing requirements;
- environmental assessment and permit requirements;
- zoning and land use issues;
- land ownership/acquisition; and
- infrastructure requirements and related approvals.

Early engagement with the regulators, the public and other stakeholders will assist to focus efforts and improve regulatory efficiency.

This report has been prepared by Jacques Whitford with the input, assistance and guidance of government departments and agencies. The report may not be relied upon by any person or entity, other than for its intended purposes of providing general guidance to renewable energy project developers, without the express written consent of Jacques Whitford and the New Brunswick Department of Energy.

This report was undertaken exclusively for the purpose outlined herein and is limited to the scope and purpose specifically expressed in this report. This report cannot be used or applied under any circumstances to another location or situation or for any other purpose without further evaluation of the data and related limitations. Any use of this report by a third party, or any reliance on decisions made based upon it, are the responsibility of such third parties. Jacques Whitford accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

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This report presents the best professional judgment of Jacques Whitford personnel available at the time of its preparation. Jacques Whitford reserves the right to modify the contents of this report, in whole or in part, to reflect any new information that becomes available. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the information and conclusions provided herein.

This report has been prepared by a team of Jacques Whitford professionals on behalf of the New Brunswick Department of Energy.

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Agency/Organization	Web address
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NB Power	http://www.nbpower.com/en/default.aspx
Pembina Institute	http://www.re-energy.ca/
Saint John Energy	http://www.sjenergy.com
Canadian Renewable Energy Alliance	http://www.canrea.ca/
Federal Government	
Atlantic Canada Opportunities Agency (ACOA)	http://www.acoa.ca/
Ecoaction Canada (EcoEnergy for Renewable Power)	http://www.ecoaction.gc.ca/ecoenergy-ecoenergie/power-electricite/index-eng.cfm
Natural Resources Canada	http://www.nrcan-rncan.gc.ca/com/eneene/renren-eng.php
NRCan, Canadian Renewable Energy Network	http://www.canren.gc.ca/default_en.asp
Canada Business	http://www.canadabusiness.ca/gol/cbec/site.nsf/en/index.html
Environment Canada	http://www.ec.gc.ca/default.asp?lang=En
Department of Fisheries and Oceans	http://www.dfo-mpo.gc.ca/index-eng.htm
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Department of Energy	http://www.gnb.ca/0085/index-e.asp
Department of Environment	http://www.gnb.ca/0009/index-e.asp
Department of Natural Resources	http://www.gnb.ca/0078/index-e.asp
Other Province's Department of Energy	
Alberta Department of Energy	http://www.energy.alberta.ca/index.asp
British Columbia Ministry of Energy, Mines, and Petroleum Resources	http://www.gov.bc.ca/empr/
Manitoba Department of Science, Technology, Energy, and Mines	http://www.gov.mb.ca/stem/
Nova Scotia Department of Energy	http://www.gov.ns.ca/energy/
Ontario Ministry of Energy and Infrastructure	http://www.mei.gov.on.ca.wsd6.korax.net/english/index.cfm
Newfoundland Department of Mines and Energy	http://www.nr.gov.nl.ca/mines&en/
Prince Edward Island Department of Environment, Energy, and Forestry	http://www.gov.pe.ca/enveng/index.php3
Saskatchewan Department of Energy and Resources	http://www.er.gov.sk.ca/
Yukon Department of Energy, Mines, and Resources	http://www.emr.gov.yk.ca/

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NB Power	General	Phone: 1-800-663-6272 Email: customerservices@nbpower.com
NB Energy and Utilities Board (NBEUB)	General	Email: general@nbeub.ca
Perth-Andover Electric Light Commission	General	Phone: (506) 273-4959
NBEUB	Licensing applications, John Lawton	Phone: (506) 658-2504
Saint John Energy	General	Phone: (506) 658-5252
Federal Government		
Atlantic Canada Opportunities Agency (ACOA)	Renewable Energy contact, Lori Robinson	Phone: (506) 452-3335 Email: lori.robinson@acoa-apeca.gc.ca
Ecoaction Canada (EcoEnergy for Renewable Power)	General	Email: ecoenergyrp@nrcan.gc.ca Fax: (613) 995-8343
Natural Resources Canada	General	Phone: (613) 995-0947
Canada Business	General	Phone: 1-888-576-4444 Fax: 1-888-417-0442
Environment Canada	General	Phone: (902) 426-7231 Fax: (902) 426-6348 Email: 15th.reception@ec.gc.ca
Department of Fisheries and Oceans	General	Phone: (613) 993-0999 Fax: (613) 990-1866 Email: info@dfo-mpo.gc.ca
Industry Canada	General	Phone: (613) 954-5031 Fax: (613) 954-2340 Email: info@ic.gc.ca
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Frequently Asked Questions

Why develop renewable energy in New Brunswick?

New Brunswick has a favorable market for large and small renewable energy projects. Several major projects are currently being developed, with more opportunities in the future. The province has a renewable portfolio standard, further showing its desire to expand renewable energy development. The province has world class wind and tidal energy potential, a government willing to work directly with developers, and a work force eager to be trained and put to task with new projects. The province also has a tax and benefits structure that is favorable to businesses. Finally, geographically the province is close to major loads in New England and the Maritimes and has a strong transmission system that is open for access.

How is renewable energy defined in New Brunswick?

The Electricity from Renewable Resources Regulation, filed in July, 2006 under the Electricity Act, outlines what the provincial Minister of Energy can approve as renewable energy. As noted in Section 4(1), a developer of renewable energy must satisfy that:

"(a) the facility generates alternative-use electricity, biogas-fuelled electricity, biomass-fuelled electricity, solar-powered electricity, water-powered electricity or wind-powered electricity, as those terms are defined in the Certification Criteria Document, and

(b) the facility is certified under the Environmental Choice Program established by Environment Canada as producing Type III Electricity, as that term is defined in the Certification Criteria Document." (Department of Energy, 2006)

When do I need NBSO approval to connect to the grid?

If your project will be connected to the transmission grid, it needs to be assessed by NBSO. Prior to connection to the transmission system the developer will need to enter into a Generation Connection Agreement and a Transmission Service Agreement and become a Market Participant.

How long do Connection Assessments take?

The Connection Assessments can be completed in parallel with various other planning and regulatory requirements. The Feasibility Review is generally completed within two weeks of the submission of a completed application. The System Impact Study and Facilities Study typically require a month upon receipt of the required information. The timelines are subject to the workload of the NBSO and external resources required to undertake the reviews/studies.

How are the general scales of electricity generation defined in NB?

There are four scales of generation:

- Large - > 3 MW, which triggers a provincial EIA and which must be connected directly to the transmission grid.
- Medium – 2 to 3 MW, does not trigger an EIA, but is connected directly to transmission grid.
- Small – 100 kW to 2 MW, embedded generation, usually connected to the distribution system and requires a contract with NB Power Distribution Company.
- Micro - < 100 kW, net metering, contract with NB Power, excess energy banked on grid for up to one year, up to 100 kW.

For more information on scales of generation, see Section 1.3.5

How do I become an electricity market participant?

In order to have access to the New Brunswick Electricity Market, you must be authorized to do so by the NBSO. You would not need to be a market participant for net metering or embedded generation projects. Accreditation is the process by which persons become Market Participants and constitutes the authorization process referred to in the New Brunswick *Electricity Act*. Under the New Brunswick Electricity Market Rules, Market Participant status is required in order to undertake any of the following activities:

- buy or sell in the market;
- supply ancillary services to the market;
- register a Facility with the NBSO; and
- take Point-to-Point or Network transmission service.

Are provincial and federal environmental assessments combined in New Brunswick?

No, each EA process is run separately, but in parallel, under New Brunswick environmental regulations. However, federal and provincial governments typically cooperate informally to ensure coordination of environmental assessment processes. New Brunswick does not currently have a formal agreement in place however the requirements of both processes are similar in many respects. The NBENV and the responsible federal authority will typically work co-operatively and an effort is made to harmonize the information requirements to serve both processes.

What federal authorities are typically involved in Environmental Assessments?

The Canadian Environmental Assessment Agency is the Federal coordinating agency for all comprehensive studies and multi-jurisdictional EAs under *CEAA*. The following federal authorities are

often responsible authorities for the EA under *CEAA* for renewable energy projects (depending on the type and scope of the project).

- The Department of Fisheries and Oceans (DFO) will be a Responsible Authority if there are *Fisheries Act* triggers (e.g., tidal power project, hydroelectric project).
- Transport Canada will likely be a Responsible Authority in marine related projects as well as for projects involving water crossings.
- Natural Resources Canada could be a Responsible Authority if the *Explosives Act* is triggered (blasting during construction).
- Environment Canada could be a Responsible Authority if ocean dredging and disposal is required.

Other Federal Authorities, such as Environment Canada, Health Canada, Indian and Northern Affairs Canada, and Natural Resources Canada may provide expert advice during an Environmental Assessment.

What triggers a federal Environmental Assessment Comprehensive Study?

There are several triggers for a federal EA Comprehensive Study in regards to renewable energy, all of which can be found in Section 2.2.1.4.

Which projects require assessment under the provincial environmental impact assessment process?

There are a total of 24 categories of projects which require EIA assessment, only some of which apply to renewable energy development, a listing of which can be found in Section 2.2.2.1.

What is the process involved in a Comprehensive Review for a provincial EIA?

If a Comprehensive Review is required, the following key process elements are undertaken:

- Development of Draft Guidelines for the EIA;
- Public input to Draft Guidelines;
- Issuance of Final Guidelines for the EIA;
- Development of Terms of Reference to meet the Final Guidelines;
- Development of an EIA Report (also referred to as an Environmental Impact Statement or EIS);
- Public Meeting; and
- Decision by Lieutenant-Governor-in-Council.

When choosing the site for project development, what aspects should be considered?

Choosing the best location for a renewable energy project can be affected by a number of factors. Especially where some developments need to be placed at the point of resource use, such as in a river for a hydro dam or on a hill top for a wind farm, developers need to consider a number of aspects of provincial and federal regulation. Proximity to water and waterways are heavily regulated, view Section 2.4 for more info. If air quality can be a concern, such as for biomass boilers, view Section 2.5 for more info. Land use will likely be a consideration; if so, view Section 2.6 to understand regulations concerning protected areas and crown lands regulations, with more information on land acquisition options in Section 2.12. Certain land or waterways may have species of flora or fauna that are protected, and are therefore regulated, with information found in Section 2.7.

What is the process for developing a wind farm in New Brunswick?

The development process for each wind facility can vary dramatically from one project to the next. A typical project could be expected to perform the following activities: Pre-feasibility Study, Wind Monitoring, Community Education, Approvals (land, municipal, environmental, etc), Feasibility Study, Financing, Construction, and Operation/Maintenance. This list is by no means exhaustive. Developers are expected to investigate what other activities they must perform in order to build and run their proposed facility, and to look at the flowchart for wind energy development, Figure 6. More detailed information can be found in Section 3.1.

What is the potential for hydro-electricity in the province?

Based on a study conducted in the 1980s, there is potential for small scale hydroelectricity development in the province, with approximately 52 potentially practical sites (meaning that their energy potential compared to the cost of development was good in the 1980s), with a theoretical total installed capacity in the order of 340 MW, focusing on hydro development in the 1 to 20 MW range.